

COAL AGE

McGRAW-HILL COMPANY, INC.
JAMES H. McGRAW, President
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Devoted to the Operating, Technical and Business
Problems of the Coal-Mining Industry

R. DAWSON HALL
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Our Wasteful Railroads

FEW consumers of coal are more wasteful than the railroads. It would be difficult to make a coal operator wax eloquent on this defect. He is apt to regard this trait as a virtue and to keep silence lest the railroads should be spurred to action or their inveterate enemies should force them to it.

But perhaps the operators would feel more disposed to advocate a measure of economy if they believed it would help rather than injure the coal industry. The railroads, if they introduced stokers, or pulverized-coal furnaces, could be converted into users of fine coal. In doing this they would aid the coal companies by increasing the market for screenings.

Here lies one of the largest outlets for fine coal—an outlet that so far has never been developed. The change would be so beneficial to the railroads and so much less revolutionary, expensive and questionable than electrification that it would seem they should easily be induced to consider it. We commend this matter to the consideration of the Research Committee of the National Coal Association, which we believe, is looking for opportunities for the marketing of screenings and to the anthracite companies which find the disposal of fine coal a difficult problem. What a blessing it would be to the latter if the railroads that have ceased to burn anthracite or are now using an excessive quantity of soft coal would return to the fuel they once burned, consuming however, the finer sizes that are now a drug on the market. The public utilities have blazed the trail that leads to the use of fine coal. Let the railroads follow it.

Briquetting Incombustible

MUCH wonder has been expressed that briquetting as a process has been so slow to justify itself. The exact reasons are not quite clear, but there are many that might be advanced. Some of the briquets are not durable. They are not waterproof and they soon fall apart. Most of them are made from fine coal which usually contains a large percentage of incombustible material. Washing of this coal when the attempt is made in a crude way is extremely wasteful, and there is a big waste of good binding material in briquetting so much rubbish with the pure coal. Moreover, the public when it gets the briquet not only has a fuel with a low heat content but finds that it has an unusual ash nuisance with which to contend.

Today, we record a commendable effort to present the public with an unusually pure briquet having a binder of real fuel value, and it will be seen whether it makes the headway on the market that its sponsors have reason to anticipate. If it does it will either sweep the field or induce briquetters to pay more atten-

tion to the importance of washing coal before briquetting it.

The domestic consumer may have an extremely hazy notion as to effect of the freight paid on incombustible on the cost of running a furnace. He may not realize just how much he is hampered by the presence of ash. He may not sense its effect in causing a loss through unburned coal. But he has a keen perception of what is the aggregate cost of maintaining his fire, and he is actuated by that perception, with the result that he will ultimately turn where the best results are obtainable.

The selling of coal, briquets and oil is subject to modes like the fashions, but in the end, after many jumps in the dark, the consumer will alight and will stay where he is convinced that his interests are best served, no matter how persuasive may be the salesman who for a brief while reaches his ear and obtains his nimble dollars.

The Unsafety of Safety Lamps

DAN HARRINGTON'S article on the safety lamp and its dangers, contained in our issue of Oct. 30, must have raised in many minds a question as to the inherent safety of such lamps. It is interesting to note, however, that all so-called failures of safety lamps in this country have been shown to be due to their being in what the U. S. Bureau of Mines would term unpermissible condition. They were key-locked lamps which the mine examiners or others had taken apart in the mine to relight or else they were improperly assembled and would not have passed any of the simple examination tests of a well-instructed lamphouse tender.

This much, however, is certain: The lamps were the cause of the disasters enumerated, and Dan Harrington is justified in regarding that form of equipment as unsafe if in its use disasters frequently occur. Why they occur is only a matter of importance if we, knowing how they happen, can prevent their recurrence. The ugly feature is that we have known how to fore-stall them for so many years and still the accidents happen. We want a device that does not contain this menace, if we can get it.

The electric lamp is safer than the closed flame lamp, but it does not show the presence of gas. Consequently with it men will continue to work in a dangerous atmosphere. Their work would be quite safe so far as the electric lamp is concerned, but as there are many ways in which gas can be exploded it is necessary that the workmen should be warned, and speaking broadly: How shall one operate a gaseous mine without a flame safety lamp? There are ways of testing gas, more accurate and certain than the lamp affords, but they are slow and not as simple. We may, however, have to adopt them.

Alternating-Current Locomotive Haulage in Mines Must Wait

SIGNIFICANT to the future of electric traction in the mining industry are the locomotives for which the New York, New Haven & Hartford R.R. Co. has recently placed its contract. Though they receive alternating current from the transmission lines they are actually driven like their predecessors by direct-current motors. These railway locomotives contain their own voltage-reducing and power-converting substations.

They are equipped with a transformer for lowering the 11,000-volt, 25-cycle, single-phase current to 2,300 volts and with a synchronous motor-generator set to convert that current from alternating to direct. The traction motors are of the direct-current railway type as are those at the coal mines. The direct-current generator which delivers current to the traction motors is designed with a variable field, and the speed of the locomotive is regulated by the field control of the generator.

So despite all the advance in electrical matters the traction motors are still of the standard series direct-current type similar to those used in coal mines. It appears, therefore, that the coal operator has the equipment that is best suited to his needs and indeed that which fits best all traction equipment.

Evidently though the electric haulage of the far-off future may be by self-contained storage-battery locomotives, those which are operated from power lines will probably continue to use direct current.

Why All This ADO?

ALBERTA and British Columbia have a wealth of coal—good coal—and Canada in all its central provinces has none. It is pathetic to notice what a complex this has created. In the United States it would be said: "It's magnificent coal but what use is it? Leave it where it is. In twenty or thirty years it will be valuable perhaps. Meanwhile we will mine it for local use. It is not wealth at present but it will be in time." The U. S. Geological Survey would calculate its extent and its thickness, put a price of \$60 to \$600 an acre on it according to its purity, quantity and depth, write a bulletin or two about it and everyone would forget it.

But when it is in Canada that is just what Canada cannot do. Everyone proceeds to open it and clamor because it cannot be transported to the distant markets of the country. The operators suffer from the insurmountable obstacles and look to the government to help them out of the economic blunder they have made. The investment looked like patriotism to them, but was it? They sought to fill a need that did not exist. A mine without a market is as unprofitable as one without mineral.

The frontier of manufacturing moves slowly. As Mr. Geddes recently remarked in these pages: All would have been well if Columbus had discovered Vancouver instead of San Salvador. The march of empire would have moved eastward and Utah, Colorado, British Columbia and Alberta would have been leading manufacturing centers, and farmers would be breaking new farms in Quebec, Vermont and New Hampshire.

But unfortunately for the West, Vancouver and the Golden Gate were discovered later, and so the roping

of steers is being done in British Columbia and Alberta, in Colorado and Utah rather than in Ohio. Facts are facts and as a result the Western coal fields in Canada and the United States will continue to have scattered development. Why make, therefore, so much fuss? Coal is not coal where distance prohibits its mining.

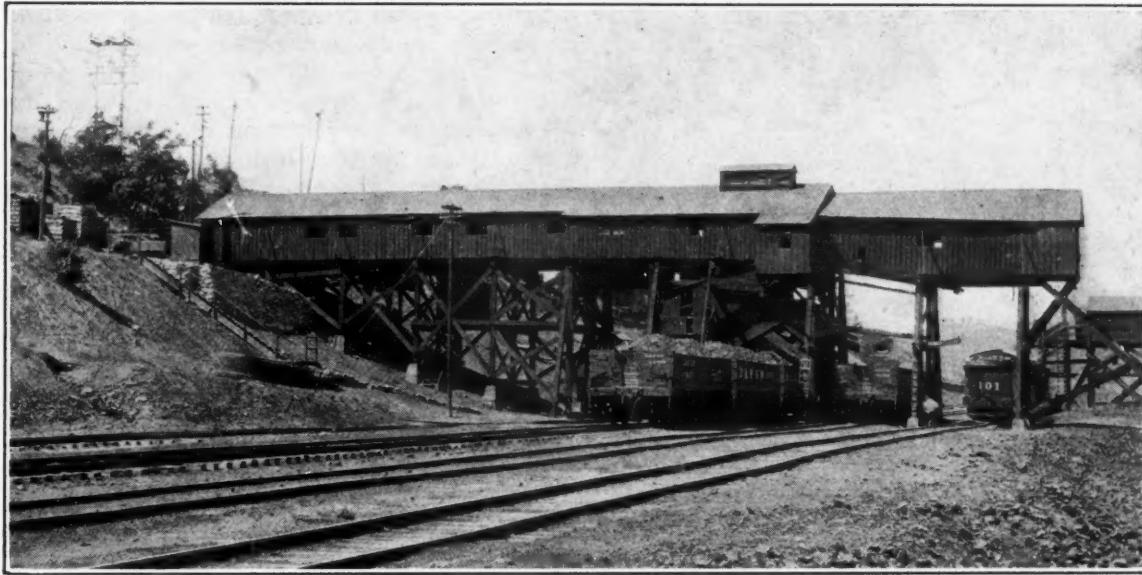
Breaking Down Bone Coal

WHAT TO DO with middlings, the coal that is high in ash but has fuel value, is one of the difficult problems of the coal operator, the more because so many companies are now buying power and can no longer solve the problem by using this inferior coal in large measure in their own power plants. In fact, it is the irony of fate that the central station came into active being just as the operator was beginning slowly to learn that he should use the middlings and the pyritic coal for his own needs. He began to buy power just too soon to learn what a wealth of opportunity existed in his unsalable coal. If he had taken earlier to stokers and pulverized fuel he might not have succumbed so readily to the blandishments of the power salesman.

What now should he do with his middlings or bone? We will not say he should invariably crush and clean them. Whether in any particular case the middlings should be disintegrated by crushing and an attempt be made to set their good coal free much depends on the character of the material thus offering itself for treatment. If the crushing fails in any large degree to break apart the coal and the ash because their admixture is intimate, crushing and cleaning will not help him. If the price of cleaned fines is too small to pay for treatment, with interest on the equipment and payment for depreciation plus a small profit, he cannot be recommended to make the attempt especially seeing that the operations reduce the tonnage. But if he can obtain by this method a fuel for which the market is greedy as is the case of the producer of a coal used extensively for stokers—a low volatile product—he is just in preparing it and indeed may be well advised if he increases the percentage of middlings including in them the "off-color" coal that he has been putting in with that of greater purity, thus decreasing its marketability and possibly its price.

It is a matter for careful consideration and for test. One is foolish to dogmatize. It would be better to construct, as a metal-mining company would, a pilot plant that would indicate what might be attained by a truly commercial operation. Some companies, at least, should find the practice highly profitable, and we look for it to become more general.

However, care must be taken to clean the fine coal in a plant so constructed that it will not waste the crushed coal by its inefficient operation or by letting the cleaner coal pass away as discolored water. The inability of some jigs to clean fine coal and the unwillingness of the market to accept the product and, what is the same thing, its inability to use it has prevented this crushing in the past. Time has changed this condition. Some users, particularly those that pulverize coal, prefer the fine sizes, and washing facilities have improved. Consequently we look for progress in this direction, especially in the South, where even in the depth of their winter season the coal will not freeze in the car. In the North dry preparation would obviate the disadvantage inherent in wet coal.



Boncarbo Coal Tipple of American Smelting & Refining Co.

V-Panel Mining Progressing in Southern Colorado

West Virginia System Minus Conveyors Is Transplanted to Boncarbo Mine of American Smelting & Refining Co.—Tracks Are Kept Parallel to Faces in Each V—Roof Gives Trouble but Cost of Coal Is Cut

BY E. W. DAVIDSON
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MINING by the V-system has caught the imagination of almost every coal-producing company in this country. Many companies have studied its possibilities as applied to their own conditions, but only a few have actually gone underground and tried it out. One of the few is the American Smelting & Refining Co. with a coal mine at Boncarbo, Colo., a few miles back in the hills from its coking plant at Cokedale in Las Animas county.

There, for nearly a year, the V-system has been on trial; not with conveyor transportation of coal from the face, as in Everett Drennen's original V-system installed in the mine of the West Virginia Coal & Coke Co. but with cars and tracks. Many obstacles have arisen, some of which have not been overcome; but, in the words of H. H. Bubb, general superintendent of the mine and the coking plant, "considerable economies of mining have been effected, and we are going ahead with the work." If the system works well enough, the use of cars probably will be continued, as 1,200 tons a day is all the company wants to produce at present, but if conveyors are considered necessary they will be installed later.

The Boncarbo mine is a comparatively new property upon which the company relies for coal to supply its 350 beehive coke ovens at Cokedale. The mine now employs between 250 and 300 men. The thickness of the coal varies from 4 ft. 6 in. to 5 ft. 6 in. and is comparatively free of dirt partings. The mine has six locomotives for gathering and one for main haulage

and has one of the best systems of heavy trackage in the West.

The experiment in V-mining started in the Boncarbo mine in March, 1924. Mr. Bubb and his mine superintendent, C. R. Garrett, had visited the Norton mine in West Virginia to see the original American V-system there, and other engineering talent had been devoted to the problem of transplanting V-mining to Boncarbo. The plan adopted was almost identical with that used at Norton except that no conveyors were installed.

The start was made in a piece of coal on the first left off the main west. This location was chosen because mining in that territory by the usual room-and-pillar method had reached that particular coal, and also because it was reasonably close to the outside and therefore handy for inspection.

PIONEER WORK REQUIRED MUCH TIME

It was decided to work three blocks at once in this initial panel, thus providing six working faces. Three entries, 8 ft. wide and at 80-ft. centers, were driven up 300 ft. to a barrier pillar and then widened out to form three V's on 45-deg. angles. This pioneering took a good deal of time and had all the other disadvantages of narrow work, but it eventually opened up the six faces, each approximately 90 ft. long.

Tracks were laid in each entry with a switch at the throat of each V, two lines of track diverging from the switch to parallel the faces. The face tracks were laid 6 ft. from the coal and were moved after every

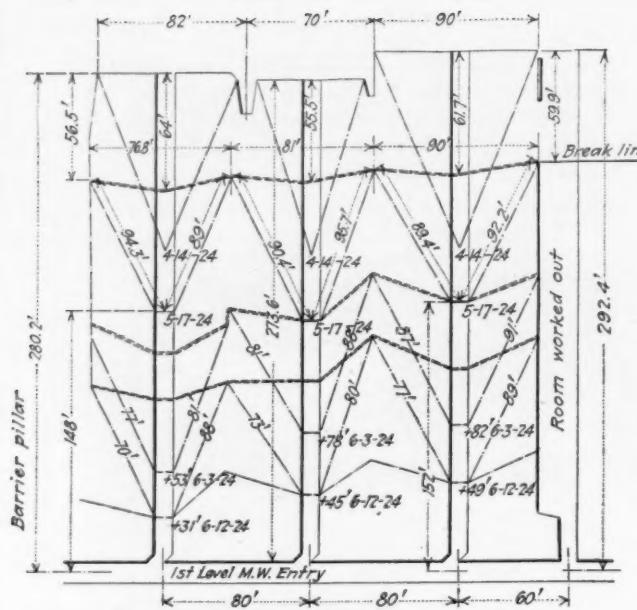


Fig. 1—Boncarbo Mine's First V-Panel

This was started in March, 1924, and was worked in stages shown by the progress dates entered at the throat of each V. The cross entries leading back from each V were spaced on 80-ft. centers but the angles of the V's were not uniform. The first effort was to break the roof in a straight line. This did not work so well and break lines thereafter were angled slightly to conform to the V's with better luck.

second cut had been loaded out. On each of these tracks as many as eight cars could be spotted at one time, but in practice this number varied from six to eight.

The crew working the trial panel was composed of seven company men and fourteen loaders. The seven company men comprised two trackmen, two timbermen, one machine runner, one helper and one shift boss. The twenty-one men includes every one working in the V-section except the driver of the gathering locomotive. Their efficiency improved greatly after they had been at the work for several weeks, proving that V-mining requires more than good engineering plans to operate successfully. The men doing the actual labor require some training, and much talent is necessary to co-ordinate the activities of the various groups.

It was planned that one mining machine should cut the two faces of one V each day, while the adjoining V was being loaded out by the fourteen men of the shovel crew. Simultaneously, the third V, which had

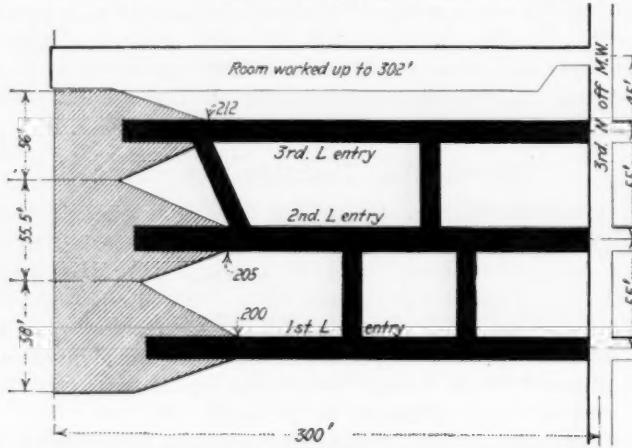


Fig. 2—How Chain Pillars Were Drawn by V-Mining

This illustrates the method followed in the triple entry that had been opened along one side of the second territory that was converted to V-panel mining, in the Boncarbo mine.

been cleared up the preceding day, was being worked by the timbermen and the track gang. Thus the three divisions of the crew rotated from V to V.

This plan, of course, made no provision for simultaneous driving of the narrow entries to prepare in advance for V-mining in any other block of coal. However, the ordinary cutting machine can cut so much more than 180 ft., which was a days' assignment for the Boncarbo machine, that the machine runner and his helper might also have driven entry with a short-wall machine had opportunity been provided.

LARGE DAILY OUTPUT PER UNDERGROUND MAN

The coal in the V-panels was undercut with a machine having a 7½-ft. cutterbar, each cut being of an average depth of 7 ft. During the whole period of about two months which was devoted to this territory, an average cut provided 126 tons. It was possible for the mining machine to make two cuts per week on each face so that the output of the six faces, when they were working every day, averaged 1,500 tons per week.

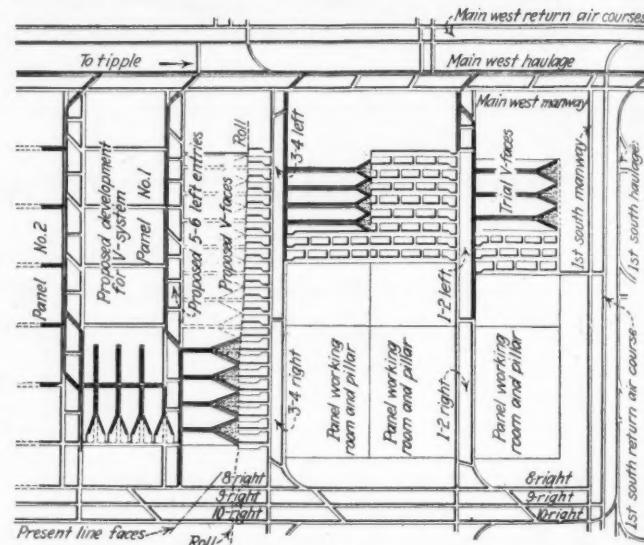


Fig. 3—This Is Boncarbo's Eventual Plan

If the mine is converted to V-mining completely, territory will be opened up probably to the barrier pillar of the nearest main entry, as shown here, with V-faces in panels retreating. A 12-ft. roadway will lead back from the throat of each V to laterals cutting the panels every 300 ft. These deliver coal to a heading at the inbye side of each panel. The chain pillar in this heading is cut back by a V-face kept in line with the rest of the panel operation.

The exact average per loader was 17 tons daily, but considering that there were twenty-one men working the territory and getting out approximately 1,500 tons a week, the daily output per underground man would be 12 tons. This is materially better than the average daily output per underground man in the mine on a room-and-pillar basis, which for a year has been wavering from 4.7 tons to 5.3 tons.

However, the V-system encountered difficulties from the start. In the first place the 8-ft. entries were so narrow that the throats of the V's were choked. There was insufficient width for placing the switches and to permit the machines to sump in. So it became necessary to round off the throat when each cut was made. This was overcome in later operations by driving up the entries 12 ft. wide instead of 8 ft.

As might be expected the roof afforded another important difficulty. The coal was immediately overlaid with draw slate ranging in thickness from 3 to 4 ft. This would come down without difficulty but above

it was a heavy sandstone stratum which would not break "according to Hoyle." The worked out area produced by the retreat of the three V blocks was approximately 240 ft. wide. This was too great a span for the sandstone. It was not strong enough to support itself firmly, and it was too strong to come down at the break lines.

The plan was to bring down the roof after each 50 ft. of retreat. When the first 50 ft. had been mined out a single row of timbers set skin to skin was erected in line with the points of the V's. But the roof would not cave at this line. It crushed the points of the V's and some coal was lost. So a stronger double break line was constructed, using 4x5-in. cap pieces 4 ft. 6 in. long. The two parallel lines of props under these cap pieces were 3 ft. from center line to center line. The line was no longer built straight across the room, but was bent in at a slight angle toward the throat of each V. This system was only moderately successful.

Then the break line was erected at 80-ft. intervals instead of 50-ft. The worked-out area was kept timbered stoutly until the full 80 ft. of depth had been attained. Then, with the double break line in place, the forest of props beyond it was pulled, with the idea that a cave would thus be made inevitable. In one attempt 636 props were removed, and the area left unsupported, but nothing happened.

After waiting for a time without result, a new type of break line was constructed with the idea of protecting the points of the V's when the roof finally should come down. A triple line of timbers was set skin to skin and this today is counted on to produce breaks at the desired places. Timbers are used liberally in front of this triple line to hold each roof area until the coal faces have retreated a safe distance. Then these props were pulled and the break line is expected to produce results. Much timber is used in each V between faces also. The timbermen are expected to keep the front row of props within 6 ft. of the coal.

Each time the face track is moved, it is laid inside the front row of props but before the second fall is loaded, new timber has been set between the track and

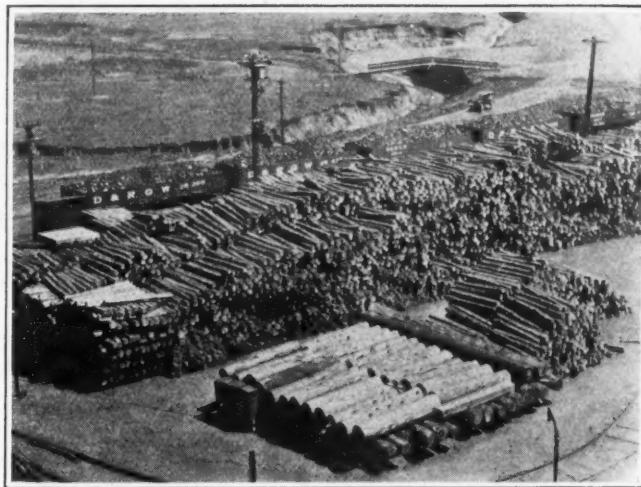


Fig. 5—Prop Yard at Boncarbo Is Well Stocked

But in spite of this heavy storage of timber it is a fact that in those sections of the Boncarbo mine where V-panel mining is in operation, the timber cost per ton of coal is "several cents" less than it is in the room-and-pillar territories.

the coal and loaders must shovel through it. This is not regarded as a serious handicap, however, and does not materially reduce the speed of loading.

Although the appearance of the territory being worked by the V-system gives the impression that much timber is necessary, the fact is that the cost of timber per ton of coal produced is several cents under that incurred in the main body of the mine where the coal is removed by the room-and-pillar method.

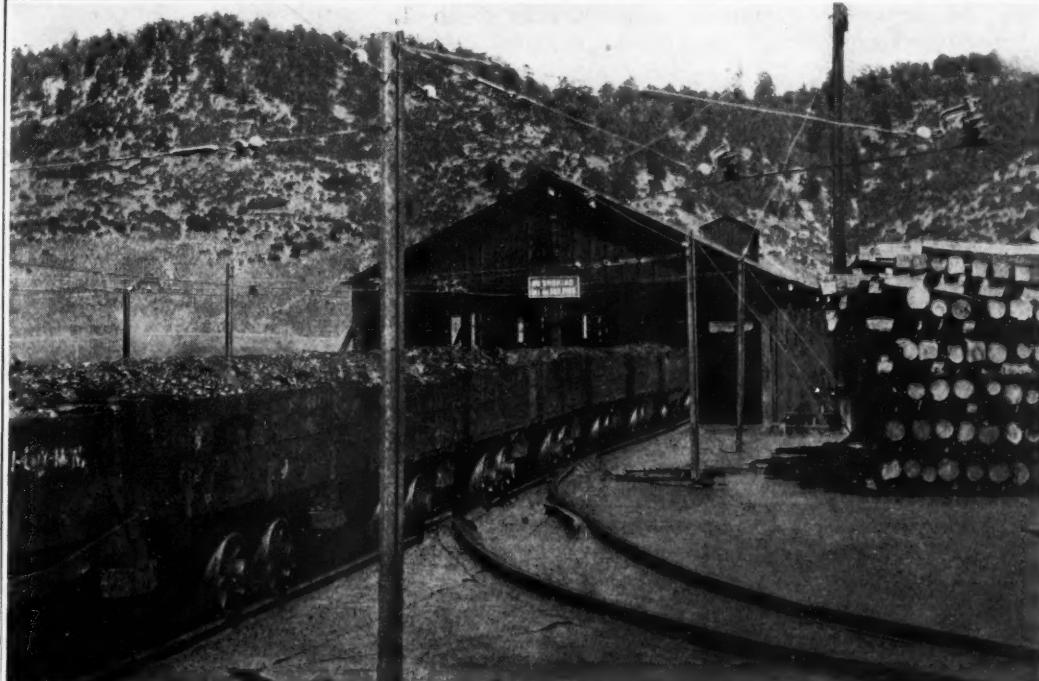
The roof difficulty was such that in the new areas now working the V-system, panel entries are laid out on 60-ft. instead of 80-ft. centers so as to reduce the distance between V points thus decreasing the roof pressure on each. The angle of each V is narrowed down also in order that the faces may maintain their full length of 90 to 100 ft. This does not obviate all roof trouble, but it has reduced it greatly, and the operators hope that the method will work successfully throughout the mine in case the whole mine is worked on the V-system.

The effort now is to finish out territories that are

FIG. 4

**Coal from
V-Panels Reaches
Tipple**

Heavy double main-line trackage steadies the movement of coal. When a trip reaches the tipple, it is coupled to the end of the string of loads standing there. A car haul feeds the loads to the dump. Empties are delivered by a kick back to the tail end of a string of waiting empties. From this string the main-line locomotive takes its empty trip. Overhead construction is made permanent by the use of steel rails for poles.



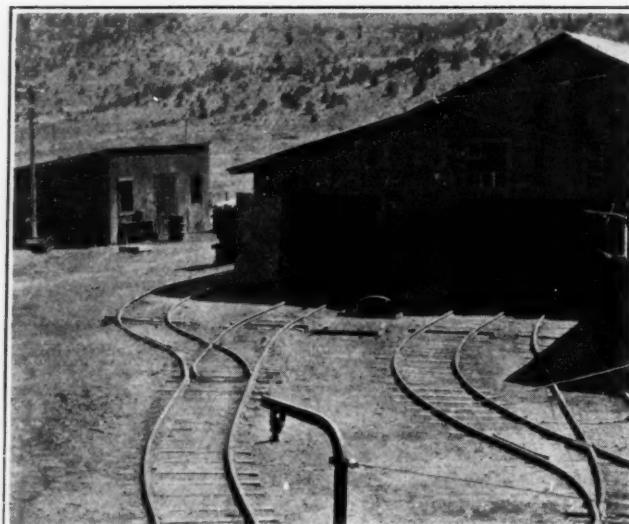


Fig. 6—A Clean Yard Bespeaks a Well-Ordered Mine

This yard with the repair shop at the right and a storage building at the left, gives some idea of the orderliness which prevails throughout the Boncarbo mine. "Spick and Span" are two of the best employees Mine Supt. C. R. Garrett has. The yard tracks are carefully laid out and kept in alignment.

partially worked by room-and-pillar so that unworked areas can be laid out for V-faces only. When that time comes, if it ever does, the active areas will be operated in panels each 250 ft. wide and 1,500 ft. long (Fig. 3). V's in sets of four to each panel will be started at the boundary and retreated. An entry 12 ft. wide leading back from each V will connect with lateral entries cutting each panel at intervals of 300 ft. The 12-ft. roadways will be kept driven back far enough so that laterals can be discarded and wiped out by the retreating V's, the haulage from each V being carried back through the new roadway to the next lateral. Chain and barrier pillars are taken simultaneously with the panel coal so that theoretically at least, extraction is complete.

In spite of the troublesome roof and other obstacles and without the conveyor which has helped to make the Norton, W. Va., mine famous, the Boncarbo mine already has shown that V-mining can be made profitable if it is intelligently done. In the Boncarbo system, the ratio of miners to company men is only 2 to 1, whereas in room mining throughout the rest of the property it is 4 to 1. However, this is no certain

indication of the reduction that could be made in the force of men necessary to get out the 1,200 tons daily that the mine must produce. It is difficult to figure what additions to company men would be necessary if the whole mine were on a V-basis.

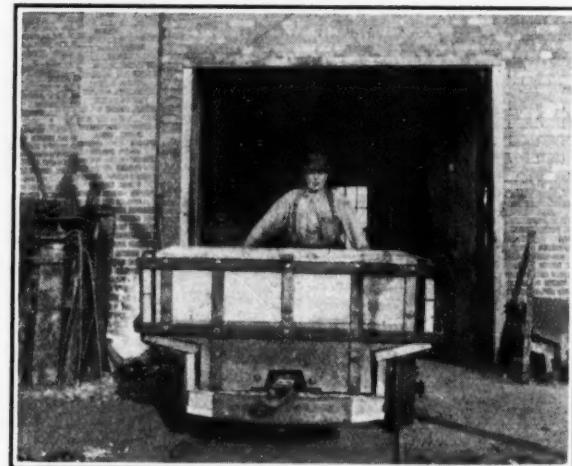
However, it is definitely proved that coal from the V-panels has been produced at somewhat less cost than coal from the rest of the mine and that a given tonnage certainly can be mined out of a much smaller area than has ever been obtained by any room-and-pillar system, with most of the advantages that are to be had from concentration of operation. And judging from the company's experience, its production can be handled readily with cars instead of requiring face conveyors. Whether the Boncarbo system of roof control is sufficiently dependable to justify conversion of the mine to V-mining remains to be determined. But at least the men of the mine have proven that V-mining has its possibilities outside of Norton, W. Va.

Mine Car Built in Less Than 3½ Hours

BY O. F. TAYLOR

Superintendent, The Elm Grove Mining Co., Laferty, Ohio

In the July 31 issue of *Coal Age*, p. 154, appeared an account of the feat of Joseph Martin of the New River Co., Whipple, W. Va., in building a mine car in 5 hr. 8 min. At 8 a.m. on Oct. 30, George Hess of the Elm



The Car and the Man Who Built It

This car is of about 2½ tons capacity. It is of the well-known 3-belt type such as is used in thousands of American coal mines. In fact there is nothing unusual about this car except the time required in its construction.

Grove Mining Co., Laferty, Ohio, started building a somewhat similar car and at 11:25 a.m. had it completed. The work on this car thus required 3 hr. 25 min.

All the material entering into the construction of this car was collected and assembled in the above time, Mr. Hess doing all this work himself with the exception of sawing the ends from three planks each 3x12 in. and 9 ft. long. These were held by the blacksmith Andy Kovach while their ends were shaped with a saw by Mr. Hess to receive the bumper irons.

In building this car 143 holes were bored and an equal number of bolts and nuts employed. The capacity of this type of car is approximately 4,500 lb. Mr. Hess is 58 years of age and weighs about 250 lb. He has been employed by the Elm Grove Mining Co., Oco Mine, Laferty, Ohio, as car builder and repairman for five years. The accompanying illustration shows the car and its builder.

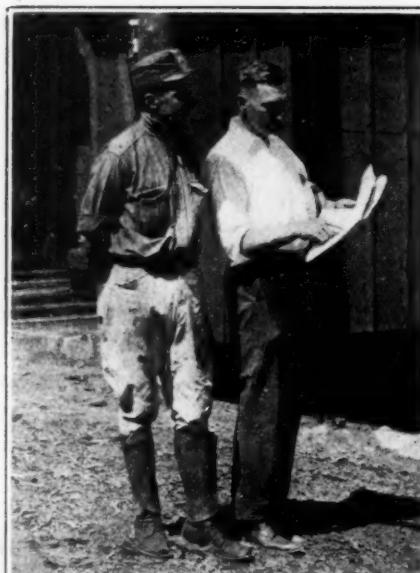


FIG. 7

The Men Who Run Boncarbo

At the right in a white shirt is H. H. Bubb, general superintendent of the mine and the 350 - oven beehive coke plant of the American Smelting & Refining Co. at Cokedale, Colo., five miles away. With him is C. R. Garrett, mine superintendent.

Plant in Newark Makes Briquets by Trent Process

Uses Screenings and Sweepings from Anthracite Yards—After Pulverization
Coal Is "Amalgamated" with Oil Forming Pellets Reducing Ash Over Sixty
Per Cent—"Amalgam" Is Then Briquetted—Advantages and Uses of Product

BY FRANK H. KNEELAND
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ONE OF THE treatments designed to remove a large portion of the ash contained in raw coal is known as the Trent process. A small plant but one nevertheless of commercial size operating on this principle and intended for treating anthracite yard screenings, culm, silt and the smaller steam sizes has been erected recently in Newark, N. J. The Trent process proper aims at material ash reduction, but this plant in Newark will eventually go much further and briquet the purified product, making it into an excellent domestic fuel in many respects superior to the best prepared anthracite.

Naturally, in the vicinity of such a center of population as New York City, where much anthracite is burned, a large quantity of screenings is available. It is the intention to utilize this material, which is both abundant and cheap, in this plant, which is being operated by the Superfuel Corporation of New York.

At present coal-yard screenings are being delivered by barge to the plant, which is situated on the bank of the Passaic River. Upon entering the plant the raw material containing from 18 to 30 per cent of ash is passed through a rod mill by which it is pulverized. The mill is fed by means of a spiral segment of pipe attached to the mill trunnion and revolving with it. At each revolution this dips into a tank or box containing coal, scoops up a certain quantity of it, and delivers it to the mill.

PULVERIZED MATERIAL ENTERS AMALGAMATOR

After leaving this mill, the ground coal is passed to a Dorr classifier which removes the coarser material, returning it to the rod mill for regrinding. Fine material or that small enough to pass a 100-mesh sieve is flushed from the classifier to the churn or amalgamator. This is a tank separated into several interconnected compartments by suitable partitions or baffles. Each compartment is provided with an agitator or paddle wheel, and all are mounted on a common shaft extending the entire length of the tank. The arrangement of baffles is such that the material in the tank passes progressively from one compartment to that succeeding, over one baffle and under the next.

To the mixture of powdered coal and water entering the amalgamator a small quantity of oil is added. The entire mixture consisting of water, powdered coal, powdered ash-forming material and oil is then violently agitated by the paddles.

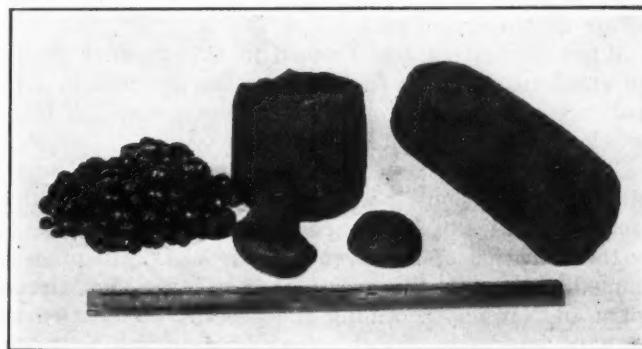
Under this action the oil will adhere readily to the coal particles but not to those of earthy matter or to the ash-forming constituents of the original coal. Furthermore, coal particles acted upon by oil, when agitated, will coalesce, amalgamate, or agglomerate into nodules or pellets, the size of which vary from that of a small shot up to that of a walnut or small hen's egg.

These pellets of coal amalgam are readily withdrawn

from the discharge end of the amalgamator, elevated and discharged to a dewatering conveyor. After draining on this conveyor they are delivered to another that discharges them to a storage pile. Ash-forming material is readily flushed out of the amalgamator and run to waste.

The pellets of pulverized coal as they come to the storage pile are not hard and unyielding but may be readily crushed in the hand or between the fingers. Though composed chiefly of oil and coal, they naturally contain some water. This gradually dries out upon exposure to the air.

The product of this process, the "amalgam" pellets, may be burned in a boiler furnace without further treatment. This fuel is being consumed under the



Pellets and Briquets as Made at Newark

On the left is shown a pile of raw anthracite pellets as they come from the agitator. In the center foreground are two baked pellets made from Rhode Island anthracite. Behind them is a bituminous briquet from which much of the oil used in the treatment of the coal has been expelled by baking, as well as some of the volatile matter. On the right is a baked anthracite briquet, ready for the market. Such briquets in a domestic fire burn evenly to a fine clinkerless ash.

boilers of the Titan Iron Works, the power station of which adjoins the coal-treating plant.

For utilization as a domestic fuel, the amalgam requires further treatment. To this end it is pressed into briquets by being passed through an extruding machine. From this it is ejected through circular orifices, the material thus forced out being cut to the required length. These pieces are then passed into a Vandergrift retort through a preheating chamber at a temperature commencing at 200 deg. F. and ending at 1,000 deg. F. During this process the oils and other byproducts are extracted.

Briquets made in this manner are hard and waterproof, make a hot, glowing fire, and do not crumble or change shape until they are entirely consumed. The small quantity of ash is extremely fine and no clinkers are formed. When burned in an ordinary stove, the fire may be banked and retained for 24 hours, without any attention whatever. A fire of this fuel also is slightly more flexible than one of raw anthracite, that is, it will respond somewhat more quickly to a change

in draft. The refuse or ash passing through the grate analyzes only 2 per cent of combustible matter. This is only a fraction of the combustible matter usually passing the grate when ordinary coal is burned.

The important characteristic of this process is the fact that the ash in the original coal is greatly reduced. Tests conducted on various coals show a varying degree of ash removal. Thus, treatment of the anthracite screenings in the manner described reduces the ash from about 18 per cent in the raw material to approximately 6 per cent in the finished briquet. Treatment of Rhode Island anthracite reduces the ash from approximately 30 per cent in the raw material to as low as 8 per cent in the pellet or globule, thus effecting the removal of 72 per cent or practically three-fourths of the total inert matter. Treatment of other coals, both anthracite and bituminous, affords results of a similar nature but varying in effectiveness with the ratio of inherent to extraneous ash in the coal treated.

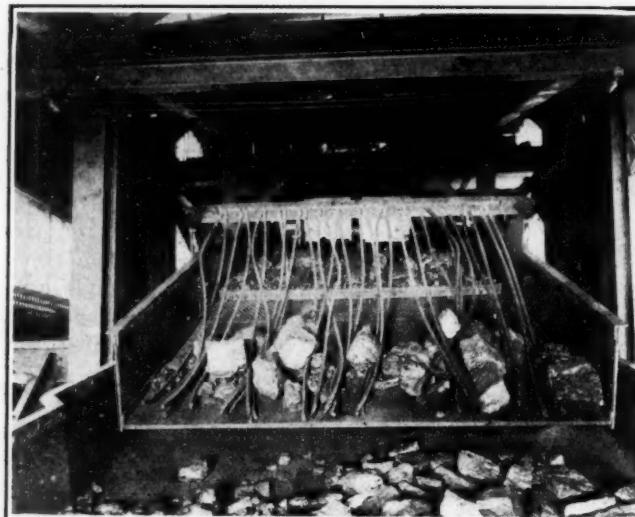
MANY FIELDS OPENED BY TRENT PROCESS

Commercially the Trent process of coal purification opens many possibilities, the scope and limitations of which must yet be determined. Thus the pellets may be fired into the ordinary boiler or metallurgical furnace either by hand or by automatic stoker; dried and again reduced to a powder, they may be burned in suspension in air as pulverized coal.

When briquetted coal treated in this manner forms an excellent domestic fuel, being superior both in convenience and in heat content to the raw material from which it is manufactured.

Time alone can determine the extent of the possibilities involved but it will undoubtedly make available large quantities of low-grade and now wasted coals. It is the intention of the Trent Superfuel Co., to proceed immediately with the erection of a large commercial plant in Newark, retaining the present installation as an experimental or "pilot" plant wherein will be determined by actual trial the characteristics of various coals and the details of processing that they must receive.

Slowing Down Coal to Lessen Breakage

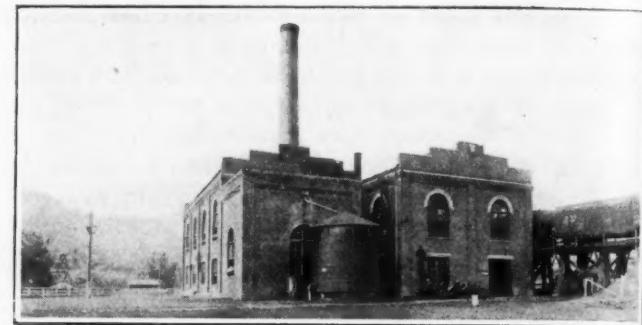


Shaker Screens at Red Jacket Consolidated Coal & Coke Co., Red Jacket, W. Va.

These screens are installed at a tipple on the Mitchell Branch. When the coal leaves the screen and gets on the smooth plate beyond it, it tends to travel too fast and is slowed down by pieces of wire rope hanging from a cross-piece on the screen.

Consolidation Transmits Power 70 Miles

The power plant shown in the illustration is the property of the Consolidation Coal Co., Millers Creek division, Van Lear, Ky. It is now shut down, displaced by a 70-mile transmission line from the Jenkins, Ky.,



Closed This Plant to Bring Power from Jenkins

When the plant became overloaded the Consolidation Coal Co. closed it and brought in power from its Jenkins Mines, the line supplying mines and villages in its course.

plant of the same company. The Van Lear plant was built in 1911. Becoming overloaded, rather than to add to the capacity, the company decided to build the power line, and an arrangement was made with the Kentucky-West Virginia Power Co. to tie into the coal company's line from 6 a.m. till 4 p.m. The Jenkins plant now has 4,000 kw. rated capacity but can carry 6,000 kw. for short periods. The power company furnishes about 9 per cent of the total power that the company uses.



Introducing "Mistuh Nobody"

Here we have the *Illinois Journal of Commerce*'s idea of the service humble coal performs. It is difficult to understand, however, why the creator of this cartoon did not also picture "Mistuh Nobody" as the arch crook robbing the henroost of the householder, and also as the goat of Washington, D. C.

Controls That Enable Pumps, Hoists and Electric Shovels to Simulate Human Direction

Pump Control Watches Water Level and Shuts Down When Water Is Low — Hoists Automatically Use Power so as to Avoid Electric Peak Loads Which Have to Be Paid for When Power Bills Arrive

BY F. L. STONE

Industrial Engineering Department, General Electric Co., Schenectady, N. Y.

ALL MINES must have a drainage system of some sort. In many operations the problem of keeping the mine free from water is one of the most difficult and most expensive of all the many to be confronted. Consequently, we find inside some of our large mines enormous pumping plants, and sometimes the capacity is large enough to supply a fairly large city. The water pumped is usually acidulous to such an extent that in many instances pumps have to be made of special and expensive acid-resisting metals.

Pumps are divided into two general classifications, namely; the multi-cylinder plunger pump and the centrifugal pump. The former requires a moderate-speed motor which is usually geared, whereas the latter calls for a high-speed motor arranged for direct connection. The motor must have moisture-resisting insulation and must be carefully constructed, particularly as to the insulation of its coils.

The atmosphere of an underground pump house is usually humid, and unless special precaution is taken the coils will breathe, taking in moist air which is deposited inside the coils and tends to weaken the insulation. The larger electrical manufacturing companies have designed a standard line of high-speed induction motors for driving centrifugal pumps.

There are no special features connected with the speed of pumps as they are usually run at constant speed until the sump is brought to the required level, after which they are shut down either automatically by means of a float switch or by hand.

Some of these pumping stations have been made fully automatic and arranged so that when the level of the sump rises to a predetermined height, a priming device comes into play which primes the pump. After the priming is accomplished the main driving motor is thrown across the line and the pump started. The main motor cannot start until the pump is primed. Should the pump lose its suction for any reason, the equipment automatically shuts down. The most up-to-

date installation of this sort, is in one of the mines of the Philadelphia & Reading Coal and Iron Co.

The selection of the proper centrifugal pump for a given job should receive careful consideration. Pump manufacturers list the same pumps for various speeds and heads. The efficiency curve of a pump in most cases shows a definite maximum and a rapid falling off either side of this point of highest efficiency. If a pump is selected to operate at a speed different from that which affords the maximum efficiency, the result, irrespective of the drive, will be an inefficient installation.

In many wet mines we find what are known as gathering pumps which consist of small portable equipments that can be moved about the mine to take care of local flood conditions. These gathering pumps are usually small plunger type units and manually controlled, being driven by an induction motor or a direct-current motor taking power from

the trolley line or separate circuits for the purpose.

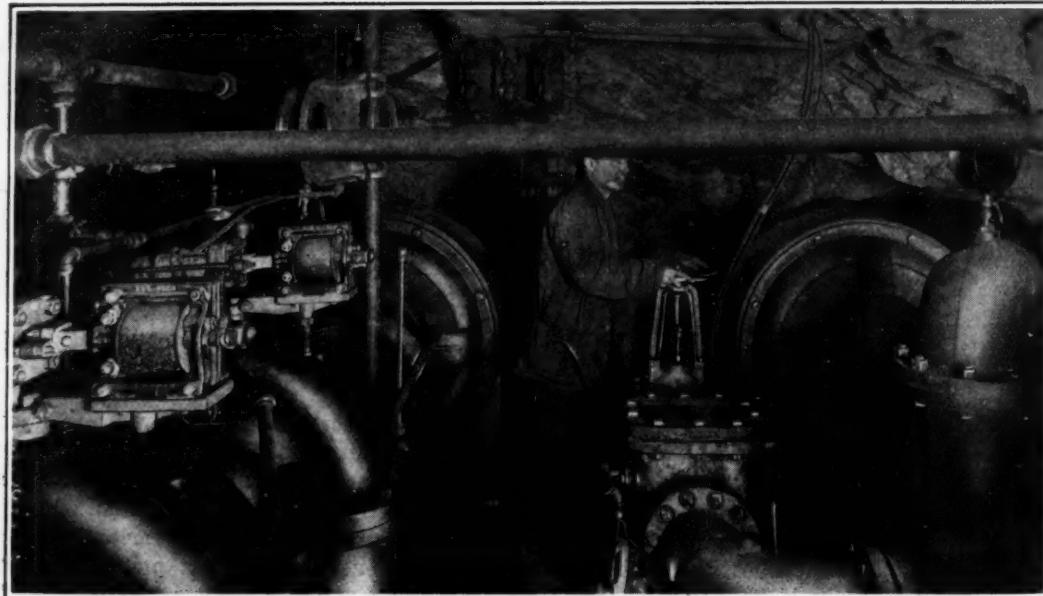
Of all the problems connected with the mine that of the proper selection of the hoist is perhaps the most interesting. Electric hoists have long since passed beyond the experimental stage and have innumerable times demonstrated their greater economy as compared with any other form of hoisting.

The electrical engineer is no longer asked to compare the economy of the electric hoist with that of the steam engine. One manufacturing company has, within the past fifteen years sold 230,000 hp. in electric hoists divided among 450 units. The only problems now to be solved are, How large the drive for the hoist shall be?; What is the best shape to make the drum?; and, finally, What is the best control system for the hoist? The question of size can be readily determined from the duty cycle. This duty cycle can be calculated with great accuracy.

CYLINDRO-CONICAL DRUM MAY CUT RATING

The best shape of drum can be determined only after several duty cycles have been made using various shapes. In many instances, a plain cylindrical drum is necessary. This is particularly true if hoisting is to

From a paper on "Electricity in Mines," read at Pacific Coast Convention of the American Institute of Electrical Engineers, Pasadena, Cal., Oct. 13-17. Parts of the same paper will be found in *Coal Age*, Nov. 6 and 13.



When Mines Have Many Cave Falls

During rainy seasons in the anthracite region no Moses' rod is necessary to strike the rocks for water. At some places many of the beds outcrop and it is an easy matter for the water to enter the mines. Even where there is a heavy rock cover the cracks in the cleavage planes permit large volumes of water to enter the mines.

be accomplished from more than one level. The conical drum and the cylindro-conical drum have only a special field of application, but in this field the proper selection of the shape is of quite vital importance. For instance, on short fast cycles the rating of the main-drive motor can be reduced as much as 35 per cent by the use of a cylindro-conical instead of a straight cylindrical drum.

With drums other than cylindrical, the upward moving load is started on the small diameter while the downward moving load starts on the large diameter. This difference in diameters reduces the starting torque materially, and in fast cycles the acceleration is frequently the controlling factor in the motor rating. This reduction of starting torque is therefore of great importance. There are limits, of course, beyond which it is not well to go in proportioning the large and small diameters.

The small diameter is usually fixed by the diameter of the rope. Conservative hoist engineers feel that the ratio of rope to drum diameter should not be less than

1 to 60, otherwise the rope will deteriorate quite rapidly due to the bending stresses. Thus with the minimum diameter determined, the maximum diameter is limited by the weight and consequent WR^2 of the drum. It is easy to defeat the entire object of the drum by running its WR^2 too high.

There seems to be no limit in the steepness of the spiral on which the rope climbs from the smaller to the larger diameter, drums having been constructed where the diameter increases as rapidly as 2 ft. per turn.

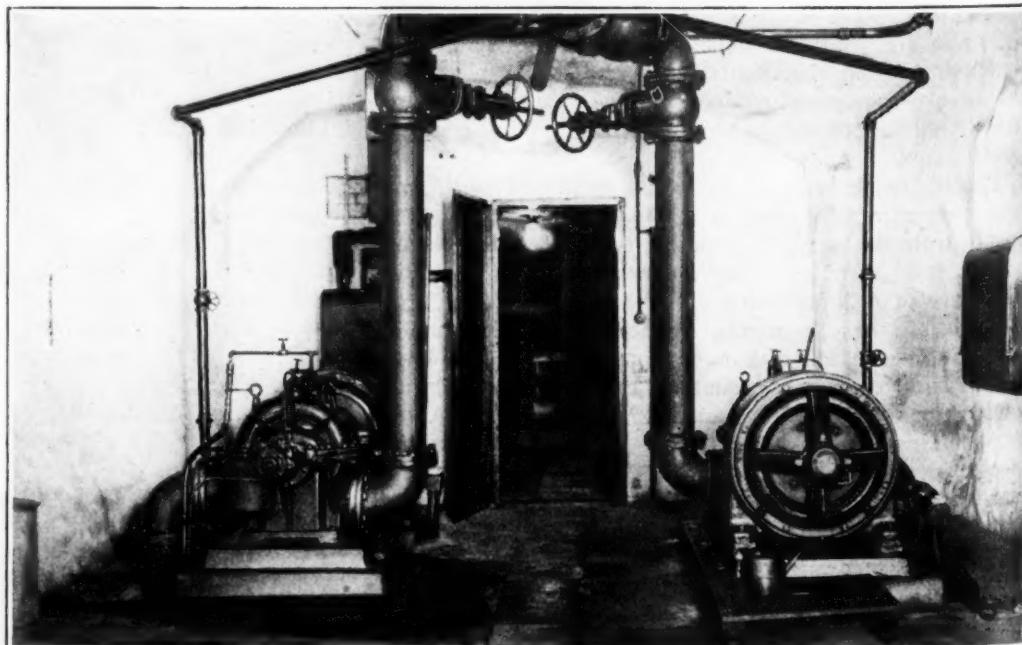
HOIST CONTROLS DESCRIBED IN BRIEF WORDS

The conical and cylindro-conical drums assist also in keeping down the peaks in deep shafts where the weight of the rope is equal to, or as is frequently the case, far exceeds the weight of the material hoisted. By the adoption of the proper drum, the overbalancing effect of the rope may be nicely compensated and the starting load reduced materially.

As for the proper drive and control to use, we have

Bituminous Mine Pumproom

The Springdale mine of the Allegheny - Pittsburgh Coal Co., Logans Ferry, Pa., makes about 500 gal. of water per minute. Practically all of this water drains or is pumped to a central sump which has a storage capacity of about 2,000,000 gal. Adjoining the sump area is the main pump station, shown here. Two centrifugal pumps, each with a capacity of 1,400 gal. per minute and driven by a 100-hp. 220-volt induction motor raise the water to the surface.



the choice of a single induction motor usually geared to the hoist drum through one set of gearing, or we have the direct-current motor driven from a motor-generator set with Ward-Leonard control, the motor-generator set consisting of a synchronous or induction motor set without flywheel.

Finally, we have a direct-current motor driving the hoist from a motor-generator set with Ilgner control. By Ilgner control, I mean an induction type motor-generator set with a flywheel large enough to prevent objectionable load peaks on the power line. Briefly, this control consists of a motor-generator set as above described and a slip regulator, which, as the load tends to rise above a predetermined value, inserts resistance in the rotor of the induction motor of the motor-generator set thereby holding the torque of the induction motor practically constant.

The load on the direct-current machine may call for

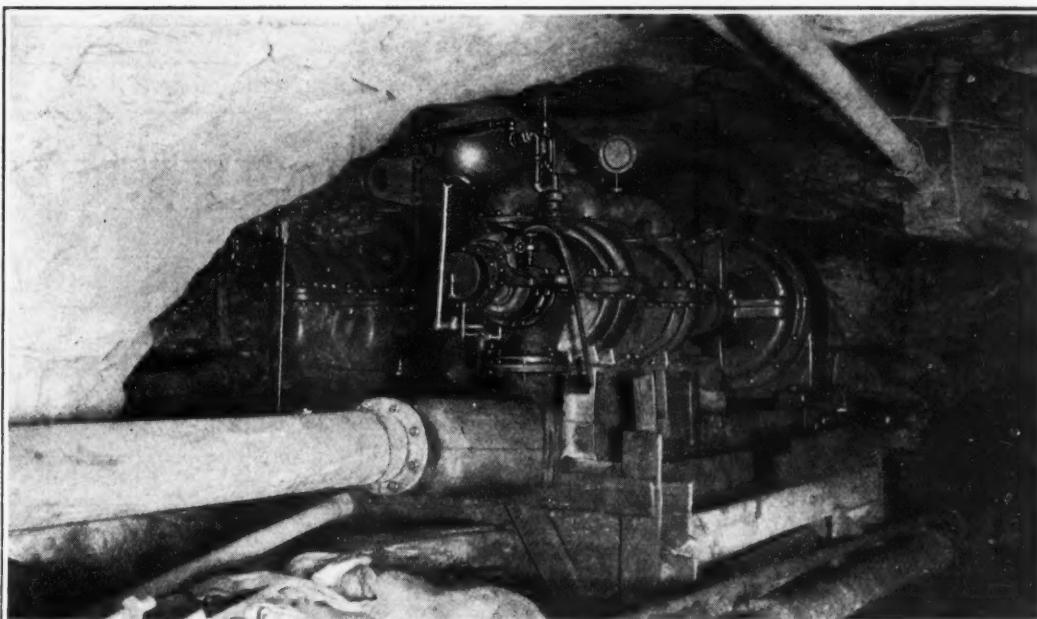
is connected across the collector rings and is cut in and out at the will of the operator by means of contactors operated from the master controller. The control is, of course, equipped with current limits so that the acceleration peaks will not go beyond certain predetermined values, but these peaks are directly upon the power plant, and no type of resistance will reduce them.

RHEOSTAT LOSS LOW WITH WARD-LEONARD CONTROL

In other words, acceleration of a given mass is to be accomplished in a given time, and it will require the expenditure of a certain number of horsepower-seconds. The acceleration of the hoist load by this method of control is exactly the same as the acceleration of any other load where a constant line potential is held. Approximately one-half of the energy taken from the line during acceleration will be dissipated in resistance.

Automatic Pumps

One of the greatest advantages of automatically operated pumps is the fact that they can be placed in remote sections of the mines and still be depended upon to function properly. In coal beds which are extremely uneven pumprooms must often be located in the solid rock. Here is one such station with two automatic pumps in the Buck Run Coal Co. mine near Minersville, Pa.



a much greater torque than the induction motor will exert. The result is the set will slow down in speed, the flywheel give up part of its energy. As soon as the load is removed from the direct-current end, the induction motor being considerably below synchronous speed will draw sufficient energy from the line to bring the set back to nearly synchronous speed and restore to the flywheel the energy it gave up during the heavy demand. A properly designed Ilgner system will keep the input to the hoisting equipment practically at a constant value, if hoisting is carried on at a constant rate, or it will limit the demand to any predetermined value.

Thus we have two distinct systems of hoist drive, one using a single induction motor of the slip-ring type with the speed controlled by a variable resistance in the rotor circuit. The second system involves a direct-current generator either direct-connected or geared to the hoist drums and a motor-generator set with or without a flywheel for driving the hoist motor. The second system naturally will cost three or four times that of the first. The question naturally arises, Why should the second system ever be used? The answer must be made from estimates of first cost and operating expenses.

The control of induction motor hoists is so simple that it needs little or no description. A large resistance

With the direct-current system using Ward-Leonard control there is practically no rheostatic loss, as the speed of the hoist is controlled by the generator voltage.

On short fast cycles this saving in acceleration losses amounts to so much that the difference in the kilowatt-hours per trip when using induction motor as compared with the Ward-Leonard is sufficient to warrant a large expenditure for the direct-current system.

Further, the direct-current system of control is much more flexible and lends itself a little better to the application of safety- and speed-controlling devices. The direct-current hoist can be run at reduced speeds with no rheostatic losses. This is impossible with the alternating-current hoist. It is impossible to state with any degree of certainty which system is the more economical until a thorough analysis of the problem is made.

Whether a flywheel is used for the equalization of the incoming power depends on two factors. First, if purchased power is used and instantaneous demands are penalized, then a flywheel should be installed. Second, if the hoist is to be operated from a small plant, either privately owned or a public utility, the addition of a flywheel will frequently be of such value in reducing the peaks on the line that even though the plant be small no additional capacity will be neces-

sary. This would not be the case if an induction-motor hoist or a motor-generator set without a flywheel were installed.

Due to the ease of control where the direct-current Ward-Leonard system is used it has been found feasible to install completely automatic hoists. By this I mean, a hoist which can be started from a push button in the morning and will run continuously for 24 hours or longer, without any manual attention.

SUITS ITSELF TO IRREGULAR WORK OF SHOVEL

Many coal deposits have been located so close to the surface that they can be obtained by removing the overburden. This system of mining is commonly known as strip mining. Large electrically-operated shovels similar to the steam shovel have been developed for this work. The largest in use at the present time is what is known as the model 350, meaning that the

entire weight of the equipment is approximately 350 tons. This shovel is capable of handling a 10-yd. dipper and has a boom 90 ft. in length. The duty on the motors of an electric shovel is probably the most severe encountered anywhere. They are continually starting and stopping and being subjected to heavy overloads. Notwithstanding this fact the electric shovel is rapidly coming into its own.

Most electric shovels have a motor for each operation, namely, the hoist, the swing and the crowd. These motors are run from individual generators which form part of a four-unit motor-generator set. The control is a slight modification of the Ward-Leonard, the difference being that each generator has a differential series field which limits the current output of the generator to a predetermined value. Thus it is impossible for the operator to abuse the electrical or mechanical apparatus beyond a certain point.

Powdered-Coal Furnace No Longer an Experiment

Furnace Life Not Shortened When Pulverized Coal Is Used—Well Fitted to Automatic Control—Use Rapidly Spreading

THE SERIAL report covering the years 1923 and 1924 of the Prime Movers Committee of the National Electric Light Association, dealing with the use of pulverized fuel carries much of interest to the coal producer, who can by this means make use of much material that cannot be marketed or does not sell at a profitable figure. The mere fact that today the use of this type of fuel is considered when any new power plant is designed is abundant proof of the practicability of powdered coal in power-generating stations. During the past few years many refinements in furnace design have been made, and many of the shortcomings of earlier installations have been overcome. All of this tends toward greater reliability in operation.

Though powdered coal has attracted most attention by reason of its application to large central stations, its value to the small plant should not be overlooked, for it is here that the largest gains in efficiency are possible. This field is receiving much attention, particularly from manufacturers of unit systems, and the results reported in many cases indicate satisfactory improvement.

The report says in part: Adapted to boiler firing several years ago for purely experimental purposes, the use of pulverized coal has today assumed such importance that it is considered in the design of practically every large power station where coal is to be employed as fuel.

Used by itself, or in combination with other fuels, it should lend itself readily to the application of automatic control, this phase of the art already having been developed commercially to some extent. This feature is, of course, especially valuable when utilized in connection with a fluctuating load or with some other fuel supply.

Recent progress in pulverized-coal development has lain chiefly in refinements to existing equipment and in obtaining the most reliable and economical arrangement of apparatus from an operating standpoint.

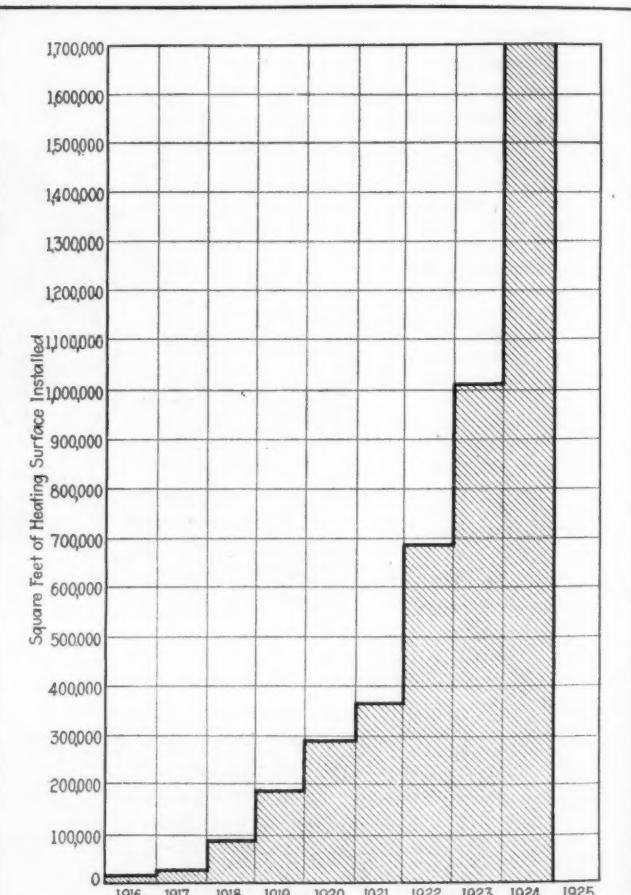


Fig. 1—Yearly Increase in Area of Boiler Heating Surface Fired With Pulverized Coal

These figures, compiled by the Fuller Engineering Co., show the rapidity with which pulverized coal has been adopted during the past few years. They show the area of heating surface in boilers fired with pulverized fuel either in operation or under construction. They do not show, it should be understood, the horsepower of such boilers.

Probably the most important developments embodied in the newer installations are the water screen, the waste-heat drier and the radiant superheater.

As engineers throughout the country become more familiar with the operation of this type of plant, much of the skepticism attending its use is being overcome, also certain difficulties at first encountered have been satisfactorily solved with the result that its adoption is now considered almost entirely from a financial angle,

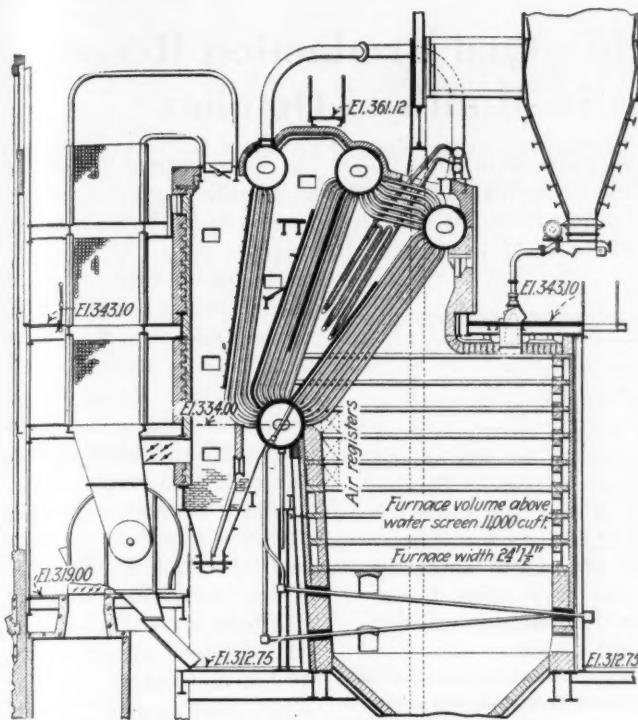


Fig. 2—Typical Powdered-Coal Fired Boiler

This particular installation is in the Middletown Station of the Metropolitan Edison Co. Although powdered fuel thus far has been used chiefly in large units it is equally well adapted to smaller ones. In order to avoid rapid deterioration of brickwork, furnace volumes must be made large.

the question of practicability being generally conceded.

As a stamp of approval that such a plant is both efficient and reliable it is necessary only to refer to the number of large companies that are either planning, building or operating central stations of large capacity using pulverized coal exclusively. Chief among these may be mentioned the Trenton Channel plant of the Detroit Edison Co., to consist of 6 sections of 50,000 kw. capacity each, the first to begin operation during 1924; the Cahokia Station of the Union Electric Light

& Power Co., St. Louis, to be built in four sections of 60,000 kw. capacity each, the first of which is now operating and the second is under construction; the third 60,000 kw. unit of the Colfax Station of the Duquesne Light Co.; the 1923 addition to the Lake Shore Station, Cleveland, Ohio, with a boiler plant consisting of four 3,060 hp. units; and the Lakeside Station, at Milwaukee, two units of which are operating, the first consisting of eight 1,333-hp. boilers and the second, now about 60 per cent complete, consisting of eight 1,828-hp. boilers.

GROWTH IN USE OF PULVERIZED COAL

The growth in the use of pulverized coal for boiler firing is best appreciated by reference to Fig. 1, which shows the yearly increase in square feet of boiler heating surface starting with 1916 as a base. The most noteworthy feature of this chart is the large amount of boiler surface under construction or contracted for during 1923. This amounted to nearly 70 per cent of the total for the previous seven years.

The question of furnace maintenance, which it was first thought would be excessive, seems to have been rapidly overcome, and today with proper proportioning of the furnace, air-cooled walls and water screens, there is no more to fear from this source of difficulty than there is with the use of stokers. Moreover, it is now becoming evident that the life of the furnace may actually be longer with pulverized coal than with stokers. This no doubt arises from the unusual care that has been expended on the materials used and on the refinements in furnace design.

FAIRBANKS, MORSE & Co. write us that the 100-hp. "kerosene" engine referred to in the M. H. Fies' article of Oct. 23, p. 577, should be revised to read "oil" engine, that company not making a 100-hp. kerosene engine.

Utah's Only Shaft Mine

This is the tipple at Castle Gate No. 3 of the Utah Fuel Co., three quarters of a mile above the town of Castle Gate. The famous "gate" of rock can be seen towering in the background. This mine, which is just getting into production, taps a seam 100 ft. below the valley floor. The tipple has a capacity of 1,500 tons a day. It is equipped with shaker screens and loading booms and is built with a wooden frame sheathed in corrugated iron. The mine has an electric hoist.



Zeigler No. 1 Shaft Breaks World's Coal Production Record By Hoisting 189,240 Tons in Month of October

THE old Zeigler No. 1 mine of the Bell & Zoller Coal Co., in Franklin County, Illinois has won its place in the sun. In October of this year it produced 189,240 tons of coal. This is the greatest monthly output of coal ever hoisted from a single shaft in the history of coal mining. The great hoist constituted a daily average of 7,008 tons, or approximately 280 railroad carloads, which is a volume of coal sufficient to stagger the imagination at any time, but especially so during a period which is "low" in the coal industry. The fact that it was done is a tribute not only to the engineering and operating staff of the company but also to the sales organization, which is coming to be recognized as one of the most effective in the Midwest.

It is worthy of note that this mine made its great run without any considerable increase being made in either the number of men or in the equipment since the month of March, 1922, when it engaged in a tremendous production race with a nearby mine just before the beginning of the strike of that year. In that month Zeigler established the then world's record for monthly output by hoisting 164,085 tons, averaging 6,077 tons daily. The greatest single day's hoist that month was 7,586 tons. During the past summer the mine was down for about three months while some equipment such as boilers was replaced. However, the mine was not rehabilitated and began producing again this fall without any great increase in mechanical capacity. The company claims that the increased output was gained largely by better organization and higher efficiency.

This historic mine, which is one of the oldest in Illinois, has weathered many a gale, especially during its early years beginning in 1904 when, under the ownership and determined management of Joseph Leiter, it produced its first coal—4,240 tons. Anti-union policies of Mr. Leiter led to various rows with organized labor during which much underground trouble was experienced, ending in an explosion—the last of a series—which wrecked the mine and shut it down in 1908. In December, 1910, it was

reopened, this time under the management of Bell & Zoller, the present operators. Since then its production has mounted steadily as is shown in the accompanying table of production by years.

Up to Nov. 1 of this year the production of No. 1 mine totaled 812,312 tons as compared with 880,428 tons at the same date in 1923. But in 1923 the mine was not shut down during the summer as was the case this year.

The company operates another whale of a mine nearby—Zeigler No. 2—which had produced 1,175,215 tons of coal up to Oct. 31, and was going strong. It has hoisted as much as 6,983 tons in one day and Its grand total production

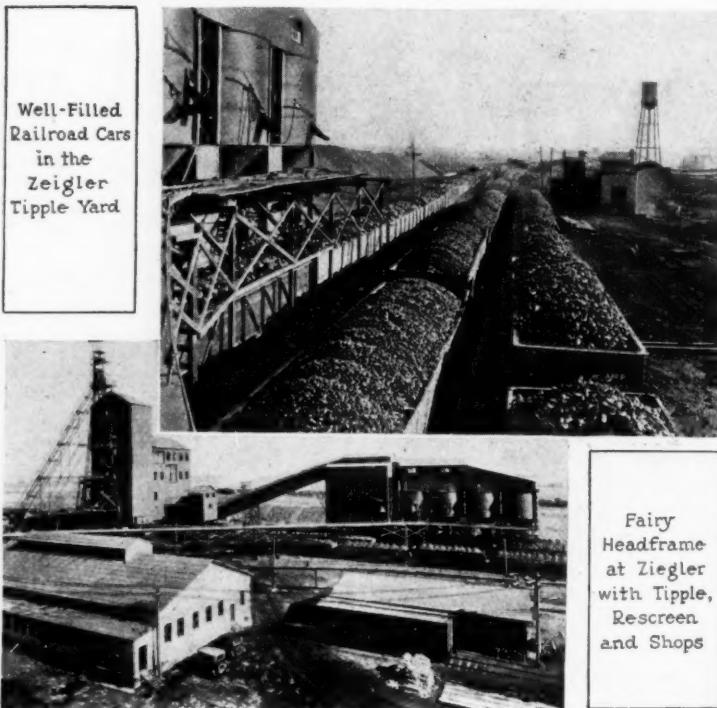
153,944 tons in one month. since it started late in 1919 is 2,567,131 tons. Thus

Annual Production of Zeigler Mine, Zeigler, Ill.

	Tons		Tons
1904.....	4,240	1915.....	816,929
1905.....	103,223	1916.....	965,187
1906.....	234,654	1917.....	937,503
1907.....	321,285	1918.....	925,002
1908.....	522,722	1919.....	1,043,956
1909.....	Closed	1920.....	959,358
1910.....	14,507	1921.....	1,155,278
1911.....	317,827	1922.....	770,716
1912.....	515,270	1923.....	1,023,009
1913.....	555,859	1924.....	812,312
1914.....	633,778		12,632,615

it is evident this company, from these two mines alone is capable of producing about 15,000 tons a day and about 340,000 tons of coal per month.

Illinois in its effort to reduce cost and promote efficiency is developing large and ever larger mines, the thickness of the coal, the levelness of the seam and the fact that the measures are seldom eroded and in most cases unfaulted, has made it possible with care in planning to bring large tonnages to the shaft bottom. But with all these favorable conditions we must not overlook the major consideration, the large viewpoint of the operator and the skill of the engineers. Both owners and managers have taken full advantage of the favoring conditions.



Well-Filled Railroad Cars in the Zeigler Tipple Yard

Fairy Headframe at Zeigler Rescreen and Shops

Be Alert to Danger When Unwatering Coal Mines

Use Closed Lights or at Least Have Someone Examine Workings Thoroughly with Safety Lamp
Before Men Are Put to Work Removing Water from Flooded Areas

BY L. D. TRACY

Superintendent, Central District Experiment Station,
Urbana, Ill.

IN THE course of their investigations into the various causes of coal-mine disasters the U. S. Bureau of Mines' engineers have noted that several gas explosions had occurred during the unwatering of mines or shortly after the removal of the water. The coincidence was so marked as to suggest that an extra hazard was present, whenever water, which has been standing against the face of the coal for some time, is suddenly removed whether by natural drainage or by mechanical means.

A typical illustration of this hazard is shown in a gas explosion which occurred in a mine in central Pennsylvania. For main entries, 50 ft. apart with an average grade of 6 per cent, had been driven down the dip of the coal, and from these mains 7 pairs of entries, at intervals of 800 ft., had been turned at such an angle that their grade was slightly rising. From these latter pairs of entries, rooms were turned practically at right angles.

The main entries had been driven for 4,500 ft. and at the face the cover was 400 ft. thick. As far as could be observed, the roof was of sandstone and the floor of clay.

The coal bed being mined was the Lower Kittanning, which has a thickness of about 4 ft. A typical analysis of the coal in that section is: Moisture, 1.6 per cent; volatile matter, 27.0 per cent; fixed carbon, 61.0 per cent; ash, 10.4 per cent, and sulphur 3.8 per cent.

For various reasons the lower part of the mine had been idle for a long time, and consequently had filled with water.

BROKE STOPPINGS AND DELAYED THEIR REPAIR

When it was decided to unwater this part of the mine, pumps were installed in the main entry, and at the time of the explosion the water was being lowered rapidly. Large holes had been broken in the brick stoppings between the main entry, which was being used as an intake for the fresh air, and the return aircourse, consequently the ventilation in that part of the mine was very poor.

During the work of unwatering this section of the mine, the mine superintendent, the fireboss and three other men went down the slope to a cross entry near the level of the water to make temporary repairs at the holes in the brick stoppings. The two officials carried flame safety lamps, but the other men wore carbide lamps.

From the evidence obtained during the investigation

of the disaster, it would appear that the two officials walked a short distance up the side entry and set in motion a slight air current, which caused the accumulated gas to work its way slowly to the spot where the men were working on the brick stoppings. As these men had open lights, the gas was ignited and flashed up the side entry, where the superintendent and the fireboss were standing, and burned them fatally.

Analyses of the mine air after the explosion showed 1.35 per cent of methane in this section, which had little if any ventilating current. As the mine was worked on an open-light basis, it must have been considered to be a non-gaseous mine.

A similar explosion in which eight men eventually lost their lives occurred in what is known as the Thick Freeport bed in western Pennsylvania. This bed is now thought to be a peculiar thickening of the Upper Freeport bed, and at this particular mine it was about 9½ ft. thick, including a slate and bony coal band of about 8 in. The roof was a good qual-

ity of shale, and but few roof falls were in evidence. A typical analysis of this coal, excluding the band near the center, would be as follows: Moisture, 2.09 per cent; volatile matter, 37.09 per cent; fixed carbon, 54.12 per cent; ash, 6.70 per cent; sulphur, 2.92 per cent. The average thickness of cover was about 120 ft. The mine was a small one, covering approximately 1½ acres, and had been abandoned ten years earlier.

ANOTHER CASE IN WHICH GUN WASN'T LOADED

The mine had only one shaft, 50 ft. deep, which was divided by a board partition into two parts, one for hoisting and one for ventilation. Prior to the explosion, natural ventilation was employed, although a fan had been installed. The mine had not been worked on any particular system, rooms and entries being driven in a more or less haphazard fashion. It is understood that the mine had been considered, when previously operated, to be non-gaseous, and open lights had been used.

During the period of idleness there had been an accumulation of water in the mine, which could be removed only at the expenditure of much energy. A centrifugal pump of a capacity of 500 gal. per minute, driven by a 250-volt direct-current motor, had been installed. A few days prior to the explosion, the unwatering of the mine had been completed to such an extent that surveyors could enter and begin a survey of the mine workings.

During the progress of the survey the men experienced trouble in keeping a light in the flame safety lamps which they were using. It so happened that none of the men had been trained in the use of a safety lamp in detecting the presence of explosive gas, and did not realize the reason why their lights were extinguished, and so exchanged them for electric flashlights, with which they finished the survey.

During the work of unwatering, the only lights supposed to have been used by the workmen were ordinary incandescent lamps, a special feed wire being taken down the shaft to supply the light required by the men working around the pump. On the day of the explosion, five men were engaged in moving the pump from a point near the shaft to a place closer to the sump, a distance of 60 ft., and the other three men were placing buntons and guides in the shaft.

While thus engaged, there was a sudden explosion which completely wrecked the hoisting equipment, and blew the three men, who were working 40 ft. below the collar of the shaft, to the surface, and landed them 30 or 40 ft. away from the shaft. Two men in the mine were instantly killed, and three men who were taken out alive, died later from burns and the effect of the afterdamp.

From evidence obtained during the investigation conducted later, it was concluded that one of the men in the mine must have ignited the gas by striking a match. Analysis of air samples obtained in the mine after the explosion showed 0.54 per cent methane.

MINE FAN WAS STOPPED AND GAS GATHERED

An explosion in a West Virginia mine which killed one man, and which would have resulted fatally for two others but for a rescue party, was closely associated with the presence of an accumulation of water.

This mine was working the Pittsburgh bed which at this point is 6½ ft. thick. A typical analysis of the coal in this mine is as follows: Moisture, 2.8 per cent; volatile matter, 37.0 per cent; fixed carbon, 51.6 per cent; ash, 8.6 per cent; sulphur, 2.5 per cent. The mine was opened by a slope, and when running produced 150 tons of coal per day.

The mine had been idle for about a week, and owing to floods in that section of the state a much larger volume of water had collected than usual. Three men, including the mine superintendent, entered the mine to make arrangements for pumping out the water that had collected. There was no ventilation as the fan had been shut down. While moving around, a body of gas was brought in contact with an open light and caused the fatal explosion.

One of the most clean-cut cases illustrating the point in question was an explosion which occurred in the opening of a new mine in Clearfield County, Pennsylvania, in which three men were killed.

The coal being mined was 4 ft. thick, and had 35 ft. of slate roof on top of which was a bed of sandstone. The coal bed is supposed to be the Lower Kittanning, although there is some doubt of its identity. The main entrance to the mine was a slope about 500 ft. long, having an average grade of 25 per cent.

Approximately 160 ft. west of the mouth of the slope a shaft 150 ft. deep had been sunk to the coal. From the foot of the shaft two entries had been driven for a distance of about 300 ft., and then stopped on account of water.

Just beyond the foot of the slope two entries had

been turned at right angles and driven parallel to and in the same direction as a line from the mouth of the slope to the center of the shaft. From these two cross entries, two entries were turned and driven to meet those which had been started from the shaft bottom.

About two weeks prior to the accident, one of these latter entries had been undercut into the corresponding entry driven from the shaft. The parallel at the same date had about 15 or 20 ft. to go before it met its corresponding shaft entry. Prior to the cutting through of the first mentioned entries, the water was said to have continued to back up until it stood 60 ft. deep in the shaft.

The ventilation of the entire mine was weak, probably not 3,000 cu.ft. of air going through all the workings. Open carbide lights were used by the men, and no flame safety lamps were at the mine before the explosion. The statement was made that no gas had ever been detected, although this fact has been questioned.

COAL UNDERCUT RELEASED GAS INTO ENTRY

On the night of the explosion, three men were working in the entry which had been cut through into the corresponding entry advancing toward it from the shaft, and which for some time previous had been filled with water. At this particular time, however, the water had been drained through the undercut which had been made, until there was a space of about 18 in. between the surface of the water and the roof.

The evidence seemed to show that part of the coal had been shot down, releasing the gas that had collected in that part of the entry which had been full of water. As the men moved around, this gas was ignited by their open lights and caused the death of the three. That the gas was not present when the men first went in was indicated by the fact that the coal had been shot down; if the gas had been present before the coal was shot, it would have been ignited while the men were preparing the shot.

Flooding a mine to extinguish a fire is another phase of this potential hazard. There is one case on record where the workings were flooded, and the water backed up into the shaft for 60 ft. or so. Evidently gas accumulated under considerable pressure, as several times it puffed out of the shaft, blowing the seal off the top. In this case there was no explosion of the gas so released, but if an open light had been near, there would have been at least an ignition.

ENTER DRAINED AREA WITH PRECAUTION

It is true that the cases cited are not sufficient to justify the hard and fast statement that there is always an accumulation of gas whenever water backs up under a head into mine workings. However, there is sufficient justification for issuing a warning that extreme care should be exercised when entering an area from which any considerable quantity of water has been drained, and especially so if that water has been standing under a high head.

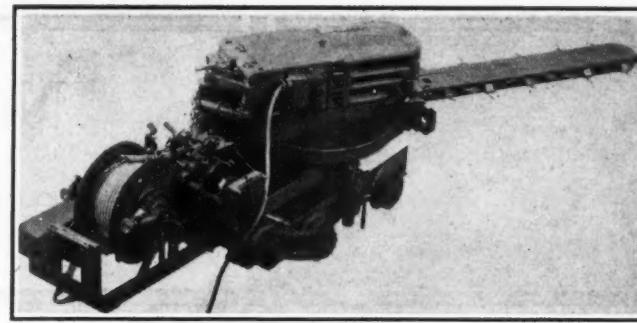
It would be on the side of safety to use only approved closed lights when working around such an area; or in case open lights are used, no one should be allowed to begin work until a thorough examination has been made by a person experienced in detecting explosive gas by means of a flame safety lamp. The safest procedure is to carry both flame safety lamps and electric cap lamps.

Adapting Shortwall Machine To Center Cutting

Undercutter Can Be Mounted on Truck So as to Cut a Kerf from 1½ to 2½ Ft. or from 3 to 4 Ft. Above Track

IN MANY mines the face can be better prepared for shooting by center cutting rather than by undercutting. This is particularly true in coal beds that carry a parting that may be removed by a center cut. Heretofore, most cutting of this kind has been possible only by the use of a specially designed and comparatively heavy machine. Recently the Sullivan Machinery Co. of Chicago, has developed a truck for an ordinary shortwall undercutter which enables this machine to perform practically the same work as a center cutter.

This machine consists of a standard Ironclad room-and-pillar machine, driven by either direct or alternating current, mounted on a special truck so arranged as to permit the cutting out of a parting without the machine leaving the truck. With this cutter, workings



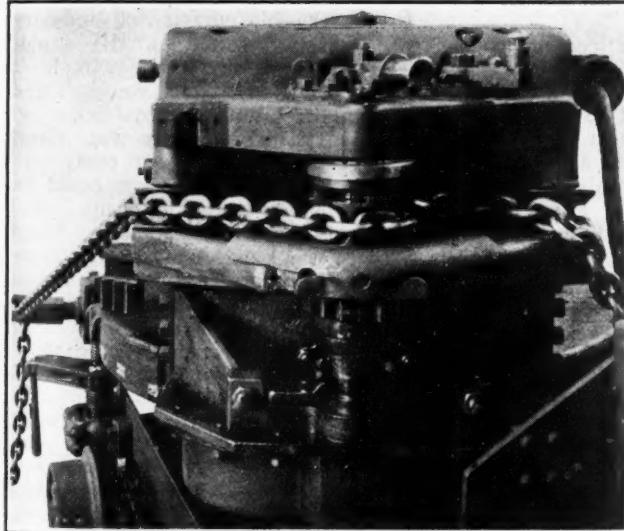
General View of Machine

The cutter itself is a standard machine, but the truck necessarily is of special design. The two details of greatest importance in this truck are the swiveling device whereby the cutterbar is made to describe an arc and the jackscrews by means of which a variation in the height of kerf may be effected.

the housing. A suitable clutch mounted above this idler permits the motion imparted to it to operate a set of gears meshing with a rack on the truck body, thus swinging the cutterbar through a circular arc. The necessary advance for sumping is accomplished by anchoring the feed chain at the face, and thus moving the truck along the track up to its work.

Machine propulsion and the arrangement of the cable reel coincide with the propulsion and reel of the Tip-turn truck used with the standard machine. A friction drive and brake are supplied by means of which a maximum speed of four miles per hour along the rails may be attained. On the other hand, this speed may be reduced to a few inches per minute, thus permitting the machine to enter rooms, round curves or cross switches without danger of derailment. The brake is sufficiently powerful to hold the machine on any ordinary grade. A reel of the self-winding type, capable of picking up the cable when the machine is at rest, as well as when in motion, is supplied. This reel is fitted with the usual roller guides to spool the cable evenly.

This outfit, as may be noted from the accompanying illustrations, forms an extremely serviceable unit for the removal of bands or partings occurring in a coal bed. The truck itself weighs about 4,500 lb., and the machine, with 7½ ft. cutterbar, weighs approximately 5,000 lb. Thus the combination of the two, or the complete center-band cutter, weighs less than five tons when ready for operation.



Rear View Showing Swinging Device

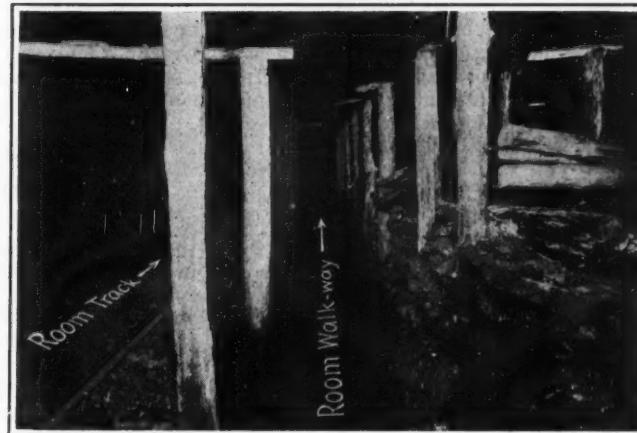
The cutterbar is revolved through its working arc by means of an idler pulley engaging the feed chain, a clutch and a pinion that meshes with a rack or quadrant. The machine is sumped and the truck propelled in the usual manner.

22 ft. wide may be driven successfully, while the circular kerf may be carried to a depth of 8 ft., the ribs or side walls meanwhile being carried straight.

A somewhat similar machine, but one without adjustment for height, has been used successfully for a number of years in West Virginia. It has been employed chiefly in driving entries and in narrow work in general, or in other words, in places where the track may be carried up to the working face.

The lowest setting of the swivel plate gives a minimum height for the bottom of the kerf of 19 in. By extending a set of jackscrews the height of the bottom of the cut may be increased from this figure up to 31 in. On the other hand, the machine may be so built at the factory as to place the maximum height of the kerf at 48 in. above the rails and permit a downward adjustment to a minimum height of 36 in., both measurements being taken to the bottom edge of the incision.

The machine is rotated on its turntable by passing the feed chain around an idler sheave on the rear of

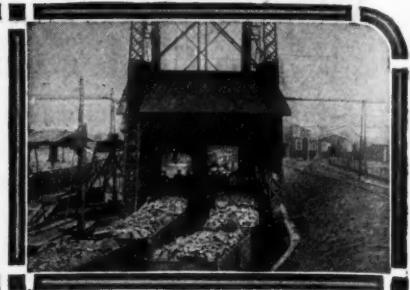


A Safety Provision Adopted in Alabama Mines

A safety walkway is provided in all underground passages that are carried forward full width. This walkway lies between the room track on one side and the packwall or gob on the other. It furnishes a straight, free passage for the workmen in traveling up or down the room.



News Of the Industry



South Penn Collieries Co. Emerges from Sproul Hard-Coal Merger

Scranton, Pa., Nov. 18.—The much discussed merger of independent anthracite companies in process of negotiation by a group of men led by former Governor William C. Sproul was consummated during the past week, when the Legitts Creek Anthracite Co. and the Von Storch Collieries Co. with several other properties, in all six groups, were consolidated. The newly merged company is known as the South Penn Collieries Co.

The new company owns mineral rights underlying 3,320 acres of anthracite lands in Lackawanna, Northumberland and Schuylkill counties and holds leaseholds of additional mineral rights underlying 620 acres. It represents the consolidation of the following properties, owned or controlled through leaseholds by previously existing companies; The Von Storch, Legitts Creek, Shepton, Treverton, Randolph and Silverton.

One Property Still Undeveloped

Of the six groups of properties, five are developed with mining operations and collieries and one is to be developed. The oldest property, which was first worked in 1859, has an operating history extending back over a period of more than 65 years. The company also will own or control four washery operations. Recoverable coal underlying the properties in which mineral rights are owned has been estimated at more than 26,000,000 tons; recoverable coal underlying the properties in which leaseholds of mineral rights are held is estimated at 11,000,000 tons. In the properties already developed there are five collieries with two shaft openings; three slope openings and nine drift openings, with present equipment for annual production in excess of 1,600,000 tons.

The Von Storch and Legitts Creek properties are situated in the Wyoming field, in the Scranton district of Lackawanna County. The mines open into one another. The workable coal, in veins 3 ft. or more in thickness, underlying these properties is in twelve and ten veins respectively, the veins varying from 3 ft. to 10 ft. in thickness.

The Shepton property is situated on Green Mountain, in Schuylkill County, in the eastern part of the central field, about 10 miles west of Hazleton. In this property there is in No. 1 Basin one vein 17 ft. to 13 ft. thick; in basin No. 2 one vein 8 ft. thick; No. 3 basin is believed to contain one or more veins not yet proved. It adjoins the Oneida No. 1, 2 and 3 collieries of the Lehigh

Valley Coal Co. and the Girard estate.

The Treverton property, where the Katherine mine and colliery is owned and operated, is in Northumberland County, in the western part of the Schuylkill anthracite field, about 10 miles southwest of Shamokin. The workable coal underlying the Treverton property, of or exceeding 3 ft. thick, is in five veins, varying from 3 to 10 $\frac{1}{2}$ ft. thick.

The Randolph and Silverton properties, which are to be operated under leaseholds, are in Schuylkill County, in the southern part of the anthracite field, the former just west of Port Carbon and the latter about 4 $\frac{1}{2}$ miles west of Pottsville. The coals underlying these properties are of good quality, the workable coal underlying the Randolph property being in eight veins from 3 to 10 ft. thick, and that underlying the Silverton property in fifteen veins, of which five from 4 $\frac{1}{2}$ to 10 $\frac{1}{2}$ ft. thick have been developed.

Officers of the South Penn Collieries Co. will include William C. Sproul, president; Newton P. Jackson, treasurer; Alexander Staples, secretary; Warren T. Acker, manager of the Lackawanna district; Hubert D. Johnson, manager of the Schuylkill district. Directors of the company include Governor Sproul, B. Dawson Coleman, president of the Ebensburg Coal Co., and director Baldwin Locomotive Works; Alfred A. Corey, Jr., president Vanadium Corporation of America; Francis V. du Pont; John H. Mason, chairman of the Bank of North America, and John P. Crozer, president of the Crozer Land Co. and director of the Crozer-Pocahontas Coal Co.

Western Kentucky Strike Runs Steadily Onward

The end of the week of Nov. 10 found the strike in western Kentucky going into its seventh official month, although some mines were closed down two weeks or more prior to April 15. Much suffering is reported in the Central City district, where miners are having trouble in getting even medicines for their sick. Many miners admit that they are willing to return to work, but are afraid to do so. Unless an agreement is reached soon it looks as if the field may be down until the autumn of 1925, as the active season will soon be over unless there is an adjustment. A few mines around the edge of the district are working on 1917 wages.

Soft-Coal Industry Benefits Consumers, Says Coolidge

In an address at a meeting of the U. S. Chamber of Commerce, President Coolidge indicated that he favored further reduction in federal taxes, pointing out that fuel and other articles pay a tax to the government and that the people pay these taxes when they buy such necessities.

The President stressed the fact that the bituminous-coal industry benefits consumers. He said: "When we look for an example of benefiting consumers we shall find it in the bituminous-coal industry. Three years ago there were about 9,000 mines, or 30 per cent more mines and miners than could be given regular employment. The Department of Commerce found there was need of more cars, more summer storage and more industrial peace. These have been accomplished, with the result that while in the profiteering period of 1920 run-of-mine coal averaged \$5.64 a ton, notwithstanding the strike in 1922 it then averaged \$3.67 per ton, and for the year ending June 30 last it averaged \$2.23 per ton. This industry has been organized but not monopolized; it has between 7,000 and 8,000 competing mines, and no person or group controls more than 2 per cent or 3 per cent of the production."

Lewis and Aides Almost Sure To Be Re-elected

Present officers of the United Mine Workers will have a candidate appearing against each of them on the ballot in the annual election of Dec. 9, but the strength of the opposition is regarded as slight, and the present incumbents probably will be elected by substantial majorities. The ballot for the election showing the names of the candidates was made public recently. John L. Lewis, international president, is opposed by George Voyzey, of Verona, Ill.; Philip Murray, international vice-president, is opposed by Arley Staples, of Christopher, Ill., and William Green, secretary-treasurer, is opposed by Joseph Nearing, of Nova Scotia.

All of the members of the auditing and credential committee, the board of tellers, and the delegates to the American Federation of Labor are up for re-election and also have opposition.

Joint Safety Conference Studies Rock Dusting

A joint safety conference held in the auditorium of the Chamber of Commerce, Pittsburgh, Pa., Nov. 10, was participated in by the American Society of Safety Engineers, the engineering and mining sections of the National Safety Council, the Pennsylvania Department of Labor and Industry, the Coal Mining Institute of America, the U. S. Bureau of Mines, the Pennsylvania State Department of Mines and the Western Pennsylvania Safety Council.

Richard H. Landsburgh secretary of the Pennsylvania Department of Labor and Industry, presented at the morning session a program of co-operative effort in safety work of industries in Pennsylvania with the Department of Labor and Industry. J. T. Ryan, of the Mine Safety Appliances Co., presided at a symposium on "Rock Dusting for the Prevention of Mine Explosions." Edward Steidle, Carnegie Institute of Technology, spoke on "The Need of Rock Dusting," and T. G. Fear, Inland Collieries Co., on "Rock Dusting the Indianola Mine."

At the afternoon session J. A. Oartel, Carnegie Steel Co., Pittsburgh, was general chairman. He introduced the Rev. C. H. Rust, Wilkinsburg, Pa., whose subject was "Men and Machines." His talk was followed by a symposium on "Practical Safety Kinks," with exhibits and slides, contributors to which were C. B. Auel, Westinghouse Electric & Mfg. Co.; J. A. Northwood, Bethlehem Steel Co., Johnstown, Pa.; A. R. Pollock, Ford Collieries Co.; J. T. Ryan, Mine Safety Appliances Co.; A. C. Gibson, Spang Chalfant & Co.; H. F. Webb, West Penn system, and C. F. Abel U. S. Aluminum Co.

A symposium on "Shop Safety Education Stunts," with exhibits and slides, had as participants A. C. Cook, Carnegie Steel Co., Youngstown, whose subject was "Running a Safety Drive," and E. S. Wright, Edgar Thomson Works Carnegie Steel Co., Braddock, Pa., who spoke on "Four Years Without a Lost-Time Accident."

Merger Plan Breaks Down Once More

For months a "big deal" has been talked of in western Kentucky. It was to result in a combine of seven big mines of about six companies. But somehow financial arrangements were not made. Now it has been postponed again, an option having expired on Nov. 10. L. H. McHenry, Louisville bond broker, is said to represent the buyers. Properties of the W. G. Duncan Coal Co., Pacific Coal Co., Wickliffe Coal Co., Greenville Coal Co. and Nelson Creek Coal Co. were among those included in the proposed deal. All of these mines are strike bound at the present time. Banks are slow to finance striking properties and, strangely, the present owners want a real return from anyone who talks of buying. Hence nothing happens.

Low Prices Realized in Disposal of Holdings of Jewett-Bigelow-Brooks

The tangled affairs of the defunct Jewett, Bigelow & Brooks Coal Co. finally have been straightened to the extent of disposing of nearly all of the eastern Kentucky coal properties once operated by the company. Creditors suffered heavily because the various public sales of mines practically fell flat. It is freely said that the returns will hardly more than pay the salaries and expenses of the receivers, E. L. Douglass and John L. Richey, of Cincinnati, Ohio.

The best mine in the group, the First Creek Mining Co. property in the Hazard field, sold to R. S. Young, of Knoxville, said to be acting for the Blue Diamond Coal Co., of Cincinnati, for \$100,000, as reported last week in these columns. This mine will be operated as the Sapphire Coal Co. The Hazard Jellico Coal Co. was returned to the Harvey Coal Co., of Knoxville, Tenn., the lessor. The third Hazard property, the Black Joe Coal Co., sold at auction for \$26,500 to W. E. Davis, of the Midland Mining Co.

In the Elkhorn district the J. B. Elkhorn Coal Co. mine sold for \$40,000 to Captain R. R. Smith, of Huntington, W. Va. These openings are on Shelby Creek. The Harlan Fox Coal Co., which was the only Harlan property of Jewett, Bigelow & Brooks, brought \$25,110 from C. Paul Downard and Elmore H. Manning, Louisville (Ky.) jobbers, who are forming a new company to operate under the old name of the mine.

In Bell County, the J. B. Straight Creek Mining Co., on which an original bid of \$7,000 had been made, finally was sold for \$15,000 to R. L. Moss, of Pineville, Ky. Two mines of the Roth Coal Co. on the Cumberland Ry. near Artemus, Ky., were in the J.B.B. string. No. 1 was returned to the lessor, Ray Moss, of Pineville, Ky. No. 2 mine, which is involved in further litigation and whose railroad connection is broken by the collapse of a big trestle, was sold for \$5.

Three properties remain in the hands of the receivers. They are the Jaybee Jellico Coal Co., with a mine that has been operating in the Dean seam at the edge of Pineville, and two West Virginia mines—those of the Seminole Gas Coal Co., close to Clarksburg, and of the Guyan Mining Co., at Logan.

All of the sales were approved by the federal court in Covington, Ky.

Explosives manufactured in 1923 exceeded by 26.8 per cent the output of 1921, figures just made public by the Bureau of the Census show. The number of men employed in the industry increased 42.7 per cent. The amount paid for wages was 37.8 per cent greater and the cost of raw materials was 28.9 per cent greater. One of the striking features of the Census return was the increase of 82.9 per cent in the output of permissible explosives. In 1923 the total output was 67,334,759 lb. There was a large increase in the output of dynamite, which in 1923 amounted to 262,290,012 lb., an increase of 56.8 per cent over 1921.

Ford Scheme Has Dock Men on Ragged Edge

Ford is playing havoc around the Head-of-the-Lakes. This is not so much from what he is doing at present, as he has little coal to sell, but because the dock men are unable to tell where the lightning will strike next year. The trade has been circularized and is urged to buy coal (Kentucky) at 20c. above dock price in carload lots. This cuts out the dealer, or would in other lines of coal. The Ford agents are handling the coal but are not enthusiastic, as they have to guarantee payments and make collections, all for 25c. a ton. The advertising states that other coals carry 13 to 31 per cent ash and that Ford Kentucky is far superior to this. This point, of course, is debatable, as the other dock men claim a much lower percentage of ash than stated by Ford.

Name Committee to Effect Uniform Tax Rulings

In accordance with a resolution adopted at the Sacramento convention the following members of the general tax committee of the American Mining Congress have been assigned by the tax division as a sub-committee to effect uniformity and justice in income taxes on coal operators: R. V. Norris, Wilkes-Barre, Pa.; Howard N. Eavenson, Pittsburgh; George Wolfe, Beckley, W. Va.; T. T. Brewster St. Louis, newly appointed on the committee; J. G. Puterbaugh, McAlester, Okla., and Paul Armitage, New York.

The tax division has asked the Internal Revenue Commissioner to reverse the decision of the revenue solicitor which gave an adverse interpretation to Art. 222 relating to items which should be charged to expenses. Mr. Brewster, chairman of this sub-committee, and McKinley W. Kriegh, chief of the A.M.C. tax division, conferred with J. G. Bright, Deputy Commissioner of Internal Revenue, on administrative matters pertaining to the audit of income tax returns of coal companies. Mr. Bright outlined several recent changes in office procedure to obtain maximum efficiency, and stated that the entire field force of the income tax unit has been instructed to co-operate with taxpayers in every possible way to effect prompt and proper adjustments of tax liability. It was agreed that the American Mining Congress sub-committee should devote special attention to proposals that will clarify the regulations and simplify the work of the unit, as well as the taxpayers.

The sub-committee it was announced, will proceed at once with the consideration of certain problems outlined by John Laing, Charleston, W. Va., author of the resolution creating this committee, including the recent adverse interpretation by the Solicitor of Internal Revenue of Art. 222, Regs. 45 and 62, which ruling the American Mining Congress has sought to have revoked.

Central Pennsylvania's Long Slump Breaks as Mines Show Signs of Life

That the coal industry is picking up in northern Cambria, Clearfield and Centre Counties is revealed by a recent survey of conditions in central Pennsylvania. Osceola Mills, in the Clearfield region, shows unmistakable signs of activity. Penn mine No. 5 is working, Dushannon mine is doing four days a week and No. 10 is working four days a week and other operations are doing equally as well. This town has the Pennsylvania R.R. yards on the mountain and with the shipping of coal the yards are active and business is looking up along all lines. A further increase in production is confidently expected with the advent of cold weather.

Houtzdale, another important coal-mining town in the Clearfield region, shows signs of revival. During the World War and for a few years thereafter, mines were opened in the back yards of homes and coal was conveyed from them in wheelbarrows, wagons and trucks to railroad sidings and loaded on cars. This prosperity could not last and soon Houtzdale found itself with a lot of mines and a lot of miners on hand and no market.

Plan for Permanency

Houtzdale survived the dark days, however, and hope has revived. The most promising sign is that the operators are planning for permanency rather than for booms. More than a year ago the Hale Coal Co. awarded a contract for sinking a shaft to tap the lower vein of high-grade coal at Morann, near Houtzdale. That operation has been completed. The shaft is of concrete, 180 ft. deep, and is electrically operated. It has four compartments, two of them for hoisting coal exclusively, the cages being self-dumping. Designed for a capacity of 250 tons per hour, the mine is equipped to ship run-of-mine, lump or slack sizes. William Wetter, of the Madeira-Hill Coal Mining Co. is general manager of the Hale company and other Madeira-Hill officials are connected with the new company.

At Mountaintdale, in the northern part of Cambria County, where the principal industries are coal mining and brick making, one largely dependent on the other, the Harbison-Walker Co. is now working, giving employment to 275 men in the coal mine, in the clay pits and on brick work.

Dependent upon the coal industry, Philipsburg, one of the oldest coal towns in central Pennsylvania, has felt keenly the severe slump in that industry. Not only did the operator and the miner suffer, but all other business. A profound spirit of pessimism prevailed. As a result, many men left the region for other locations and to seek other employment where industry was more stable.

A new spirit has appeared of late, however, with the resumption of operation at the mines. At Winburne, the Pennsylvania Coal & Coke Co. and Peale, Peacock & Kerr are working four days a week.

At Morrisdale, the Cunard Coal Co.



John Laing

President of the Wyatt Coal Co., Charleston, W. Va., who was elected president of the Kanawha Operators' Association at the annual meeting, held recently in Charleston. The other officers chosen were: D. H. Morton, vice-president; John L. Dickinson, treasurer, and D. C. Kennedy, secretary. The new board of directors consists of Col. W. M. Wiley, Col. E. O. Dana, H. L. Warner, F. A. Harris, W. C. Mitchell, F. H. Morton and C. A. Cabell.

and the Morrisdale Coal Co. are operating on half time with better prospects for the future. The Harbison-Walker Refractories Co. is operating its plants at Philipsburg, Blue Ball and Wallacetown. Brick plants at Sandy Ridge and at Retort also are running, with the prospects improving weekly. These plants all consume considerable coal and when the one is in operation the other must go. Improvement in all other towns of the region is noticeable and depression has given a place to optimism. With the election over, winter coming on and other industry starting up, prospects for the coal industry of the region are better.

Pittsburgh Terminal Absorbs Meadowlands Company

The Pittsburgh Terminal Coal Co. and the Meadowlands Coal Co. are to be merged into a new corporation known as the Pittsburgh Terminal Coal Corporation, according to an announcement made early last week. The new company will have a capitalization of \$4,000,000 of 6 per cent cumulative preferred stock and \$12,000,000 of common stock.

The present owners of the Pittsburgh Terminal Coal stock will receive all the preferred and \$8,000,000 of common stock of the new company. Holders of the Meadowlands Coal stock will receive \$4,000,000 of the new common stock. The new company will have 20,000 acres of coal land with an annual output of approximately 15,000,000 tons of coal.

The Pittsburgh Terminal Coal Co. is a subsidiary of the Pittsburgh & West Virginia Ry. but under a plan now before the stockholders the coal property is to be segregated from the railway property.

Production of Coal in Canada During August Was Lowest of the Year

Coal production by Canadian mines during August, according to a report by the Dominion Bureau of Statistics, was the lowest of the year. The decrease in quantity from the previous month was 7 per cent, falling from 730,316 tons in July to 682,878 tons in August. Compared with average output during the past five years the decrease was 45 per cent. These decreases may be explained by the strike in Alberta and British Columbia (District 18). The monthly average production of Alberta and British Columbia for the five preceding years was 686,485 tons as against 254,519 tons during August of this year. In Nova Scotia production fell from a monthly average of 504,014 tons to 403,739 tons, a decrease of 20 per cent.

Imports of coal from the United States and Great Britain decreased about 6 per cent. August imports amounted to 1,557,141 tons while in July 1,655,712 tons was brought in. The August importations this year were 21 per cent lower than the five-year average for the month. During the month 50,641 tons was imported from Great Britain. Total importation of all coal for the eight months of 1924 was 10,577,823 tons, or only 6 per cent below the preceding 5 year average for the period.

Imports of anthracite for August totaled 329,377 tons, which is 20.7 per cent less than in July but 22 per cent less than the five-year average for the month. Anthracite imported from the United States amounted to 286,964 tons, while 42,413 tons came from Great Britain. The anthracite imports during the 8 months of 1924 were 2,641,275 tons, a decrease of 9 per cent from the five-year average for this period.

Exports of Canadian coal during August were 10 per cent lower than in July. The quantities were: August, 63,415 tons, and July, 70,235 tons. Comparison of August exports with the preceding five-year average shows a decrease of about 71 per cent.

Figures on output, imports and exports, as outlined above, show that the quantity of coal made available for consumption decreased about 7 per cent from the previous month, the August total being 2,176,704 tons as against 2,315,793 tons during July. In comparison with the five-year average for the month, the August available tonnage was lower by 27 per cent. The total coal available for use in the first eight months of 1924 amounted to 18,322,277 tons.

The total number of men employed in the coal mines of Canada during August was 19,280, of whom 14,682 worked underground and 4,598 on the surface, as compared with a total of 17,522 in July, of whom 13,392 worked underground and 4,130 on the surface. The monthly production per man was 35.4 tons for August as against 38.1 tons per man for July. During August the production per man-day was 1.9 tons as compared with 2 tons in July. The tonnage lost was largely due to lack of orders in August.

Jacksonville Agreement Proves Setback To Union Fields

Fall in Prices Restricts Profits to Lowest Cost Producers—Hundreds of Mines Forced to Close—Autumn Revival Benefits Mostly Non-Union Operations

BY PAUL WOOTON
Washington Correspondent of *Coal Age*

After seven months of its operation it is possible to draw certain concrete conclusions as to the effect of the Jacksonville agreement. While it is yet too early in the life of that compact between the United Mine Workers and the operators of union mines to judge the ultimate effect on the patient of the "self-imposed surgical operation" advised by Dr. Hoover, something can be said as to the present state of health of that patient. All admit that prices have fallen to levels which restrict profits to the lowest cost producers. Hundreds, if not thousands, of mines have been forced to close. Most of the operators who have closed down their properties hope to reopen them, but sooner or later they must realize that that day never may come.

Many Large Mines Idle

Of the mines reporting to the U. S. Geological Survey, which are the larger commercial operations and not wagon mines, some 35 per cent are closed entirely. The remainder, with few exceptions, are working only part time. The story is told by the accompanying table. These figures are abstracted from the weekly reports of the Geological Survey. The table compares conditions in the union fields with those in the non-union fields. It uses as a standard of comparison the percentage of full time at which the mines in each district are operating. The first column shows this percentage for the week of July 26, four months after the Jacksonville agreement went into effect. The second column shows the percentage for the week of Oct. 25, practically concluding seven months' experience under the compact. The table follows:

Percentage of Full Time Worked at Union and Non-Union Mines

UNION		
District	July 26, 1924	Oct. 5, 1924
Illinois.....	28.6	45.9
Indiana.....	24.2	38.5
Southern Ohio.....	12.7	
Eastern Ohio.....	64.0	62.5
Pittsburgh (rail).....	35.3	51.6
Central Pennsylvania.....	39.2	55.6
Fairmont.....	32.0	43.6
Western Kentucky.....	23.1	37.4

NON-UNION		
Westmoreland.....	44.2	63.2
Winding Gulf.....	47.6	65.1
New River.....	44.8	64.1
Pocahontas.....	53.8	76.9
Tug River.....	56.3	82.6
Kanawha (C. & O.).....	43.7	56.8
Logan.....	70.1	75.7
Kenova Thacker.....	46.0	62.6
Northeastern Kentucky.....	58.2	61.3
Hazard.....	50.9	66.8
Harlan.....	48.1	67.5
Virginia.....	66.9	75.0

It will be noted that the comparison is against the union fields in almost every case. Taking the condition after

four months of the agreement it will be noted that out of the eight union districts there is only one that reached 40 per cent of full-time operation. The single exception is eastern Ohio, which has specially favorable lake connections. On the other hand, of the non-union districts there is not one that did not operate at more than 40 per cent of full time. Even the Kanawha operators on the Chesapeake & Ohio R.R. made a showing of 43.7 per cent. Though running open shop they are less free to reduce wages and labor costs than are the operators in the non-union strongholds. Thus it was that the competing Logan district, just over the mountain, which ships the same kind of coal to the same markets, was able to show a figure of 70.1 per cent.

Of course the first column represents conditions when the depression was at its depth. In July the weekly output was barely seven and one-half million tons—no greater than during the great depression of 1921. It was a time when the market was deadened by heavy stocks and by the state of the principal coal consuming industries.

Non-Union Output Higher

The figures in the second column, however, are for a period when the output is running above ten million tons—not far from the normal at that season of the year. During the week of Oct. 25 the output was 10,300,000 tons, or 2,800,000 tons greater than the output for the week of July 26. The question is, Who has supplied this additional demand? The figures show that the bulk of it has been supplied by the non-union fields.

The condition after seven months of the Jacksonville agreement is indicated by the fact that of the eight union districts only one was working at 60 per cent of full-time operation. The exception is the same as cited before, eastern Ohio with its geographical advantage with respect to the lake trade. On the other hand, each of the twelve non-union fields, with the exception of Kanawha, was working in excess of 60 per cent of full time. Thus it is apparent that the diversion of business from the union to the non-union fields continued during the more active demand of the autumn, even when the need for coal is increased as the country moves from depression into abounding prosperity.

It is true that operations in the union districts are making a better showing than they were at the trough of the slump last summer. Every one of the union districts except the Ohio fields shows a higher percentage in the last column than it does in the first, but the increases for the most part have been small as compared with those in the non-union fields, some of which—Poca-

This Mule Had Designs On the "Movies"

"The anecdotes of bright mules which have been appearing in *Coal Age*," says an engineer, "recall an interesting experience I had in 1917 when my company was receiving a considerable portion of the output of a stripping mine in northern West Virginia. I found that snapshots would tell conditions and progress of operation better than a lengthy report; therefore I carried a camera wherever I went. 'Joe' was a mule whose duty it was to spot mine cars. He was said to be about 40 years old but was pretty sleek and looked good for many more years. I took his picture once or twice. After that whenever I had the camera with me he would straighten up, prick up his ears and look at me as if to say 'Don't I look pretty?' If I did not have the camera he would remain in his usual semi-comatose state with eyes half closed, ears drooping and legs appearing about ready to collapse. I believe 'Joe' could tell at 100 yards whether I had the camera or not."

Any more?

hontas, Tug River and Logan—are reporting running time in excess of 75 per cent, which is ahead of all but the best performance during the war.

The foregoing comparison is confined to the fields of the Appalachian and middle Western regions. The remainder of the country is excluded because it is in the regions mentioned that the drama of coal is played. The area of the Central Competitive field and that of its non-union antagonists are those from which the Northwest draws both its lake and rail supplies. These are the areas that furnish the coal for the Canadian and the tidewater trade and for the fueling of the industries of the North and East. What happens outside these areas has little bearing on the making of wage agreements. The fate of the Jacksonville treaty will be settled by the results in the fields listed in the table.

Average Figures Deceptive

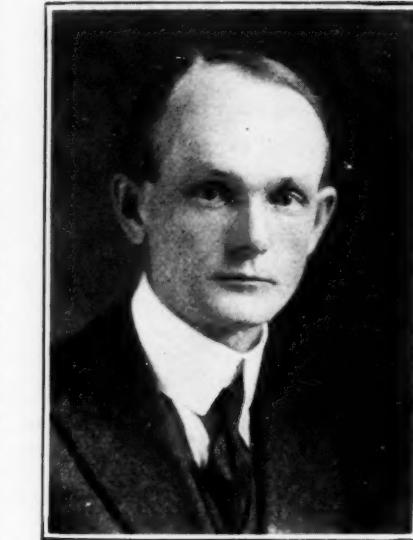
One thing is not revealed by figures of the average time worked. An average may be a deceptive thing, yet none disputes its usefulness. It never shows the extremes which go to make up the average. The averages shown in the table are made up of very unlike items. Into them go mines which are working full time and mines which are shut down entirely. The figures do not show that along with the shifting of business from union to non-union fields is a shift from the little mine to the big mine; a shift from the weak to the strong; a shift from the thin-vein to the low-cost thick-vein mines. These all represent complications which have followed the major operation at Jacksonville; their ultimate effect on the health of the patient still is to be determined.

Safety Education Planned In Kentucky

J. Wood Vance of Glasgow, Ky., State Representative from Barren County in the 1916, 1917, 1918, 1920 and 1924 General Assemblies, was selected Nov. 10 as referee of the Workmen's Compensation Board to serve in western Kentucky. His position was created due to a 400 to 500 per cent increase in the work of the board, officials said. A special meeting of the board, W. H. Jones, chief of the Department of Mines; representatives of coal operators, employees and compensation insurance carriers of Kentucky resulted in a tentative organization to promote greater safety. Those attending were R. C. Thomas, T. H. Ruddy, E. R. Clayton, R. E. Hume, J. E. Johnson, E. D. Johnson, R. E. Grace, C. J. Neekamp, representing the operators; Calvin Mays, the employees; D. A. Macwhirter, the insurance carriers; Alvis S. Bennett, R. T. Kennard, Joseph E. Lee, A. T. Bryson and Forest J. Fields, the board, and Mr. Jones. Following decision to form a permanent organization, a committee was appointed to draft a definite plan of procedure to carry out the proposed "education program for accident prevention and safety-first practices." The meeting adjourned to meet on Dec. 3 at Lexington.

Trent Company Reorganized

The present Trent Superfuel Co. is to be reorganized under new management, as the Superfuel Corporation of New York. It will at once begin the enlargement of the Newark plant to a capacity of 1,000 tons per day. Guy Standifer prominently identified with Pacific Coast shipbuilding interests, will be the new president, and Francis R. Wedlegh, former Federal Fuel Distributor and a prominent factor in the



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H. Foster Bain

Director of the U. S. Bureau of Mines, who will sail from the United States for Argentina on Nov. 22. Accompanied by three mining experts he will make an extended study of the possibility of developing the iron and steel industry in the South American republic. He goes at the request of the Argentine Government.

coal industry, will be vice-president and general manager.

Engineers familiar with the development and present stage of the Trent process activities believe that it has a promising future in the field of fuels, especially with regard to domestic heating, gas manufacture, gas producers, pulverized combustion, locomotives, steam plants, power and heating.

The distillation of byproducts should give an additional value. Plants are now in operation at Toledo, Ohio; Spokane, Wash.; Lapugnoy, France, and under construction at Moundsville, W. Va., and near Clearfield, Pa. Contracts have been signed for the erection of other plants.

14,000 Strike at Collieries Of Hudson Coal Co.

Special to Coal Age

Scranton, Pa., Nov. 17.—Disregarding orders from both John L. Lewis, international president, and district officials of the United Mine Workers, the general grievance committee of the Hudson Coal Co. on Saturday called a general strike of the company's employees effective today. As a result, eleven of the company's collieries, employing 14,000 men, are idle. Eleven other operations, the employees of which are affected by the strike order, are operating, as the men voted to work despite the committee's order.

President Lewis today telegraphed from Texas, where he is attending a convention, and demanded that Rinaldo Cappelini, district president, and David Davis, international organizer here, exert every influence to settle the strike. Long pending grievances are blamed by the general grievance committee for the walkout. Officials of the Hudson Coal Co., in full page newspaper advertisements yesterday, appealed to the men to continue work, pointing out that the walkout was illegal in that it violated the contract between the union and the operators.

Surface indications demonstrate that the local union officials are unable to check the general grievance committees in their methods of handling grievances. The Hudson company strike has been threatened time and again during the past few months and only interference by the local officials prevented it. However, the alleged insurgent element in the organization dominated, and on Saturday the strike was called. Efforts are now under way by district officials to bring about special meetings of colliery local unions to rescind the strike action at each idle colliery. This method brought results in the recent Glen Alden general strike.

Number and Output in Net Tons of Soft-Coal Mines in United States in 1923, by Classes (a)

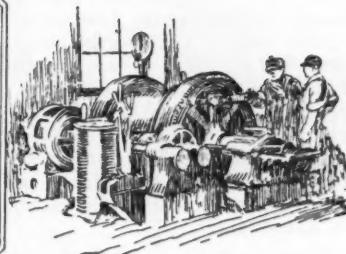
(Including Wagon Mines)

State	Class 1, producing over 200,000 tons			Class 2, producing 100,000-200,000 tons			Class 3, producing 50,000-100,000 tons			Class 4, producing 10,000-50,000 tons			Class 5, producing less than 10,000 tons			Total all classes	
	Number mines	Per cent of total	Per cent of State	Number mines	Per cent of total	Per cent of State	Number mines	Per cent of total	Per cent of State	Number mines	Per cent of total	Per cent of State	Number mines	Per cent of total	Per cent of State		
Alabama.....	24	7.6	42.5	38	12.1	25.2	49	15.5	16.0	108	34.3	14.8	96	30.5	1.5	315	20,458,000
Alaska, Calif., Idaho, and Oregon.....	...	...	...	1	0.7	9.6	4	2.7	21.4	29	19.9	48.2	112	76.7	29.8	146	1,297,000
Arkansas.....	15	5.9	37.6	19	7.5	25.6	31	12.3	21.1	49	19.4	12.4	139	54.9	3.3	253	10,346,000
Colorado.....	...	...	...	...	...	...	...	...	...	1	33.3	95.6	2	66.7	4.4	3	76,000
Georgia.....	134	21.4	74.8	82	13.1	15.2	64	10.2	6.1	98	15.7	3.0	247	39.6	0.9	625	79,310,000
Illinois.....	48	11.9	59.2	34	8.4	18.4	45	11.2	13.1	72	17.8	7.3	205	50.7	2.0	404	26,229,000
Iowa.....	4	2.4	22.2	11	6.7	27.3	19	11.5	24.6	51	30.9	22.7	80	48.5	4.2	165	5,711,000
Kansas.....	...	...	...	8	2.7	28.5	23	7.7	43.1	35	11.8	19.4	231	77.8	9.0	297	4,036,000
Kentucky.....	36	2.9	25.8	110	8.7	33.8	132	10.5	21.6	267	21.3	16.1	711	56.6	2.7	1,256	44,777,000
Maryland.....	...	...	...	3	2.0	16.5	12	8.2	37.1	32	21.9	35.9	99	67.9	10.5	156	2,286,000
Michigan.....	2	14.3	40.8	3	21.4	30.3	2	14.3	14.3	5	35.7	14.2	2	14.3	0.4	14	1,172,000
Missouri.....	1	0.4	9.1	4	1.7	14.5	18	7.9	35.9	42	18.3	28.9	164	71.7	11.6	229	3,403,000
Montana.....	4	6.5	64.0	3	4.8	13.0	5	8.1	12.1	9	14.5	7.7	46	66.1	3.2	62	3,148,000
New Mexico.....	2	3.1	20.8	14	21.5	58.3	3	4.6	7.7	12	18.5	11.6	34	52.3	1.6	65	2,915,000
North Carolina.....	...	...	...	...	...	...	2	100.0	100.0	2	100.0	100.0	2	100.0	10.0	2	36,000
North Dakota.....	1	0.7	16.3	1	0.6	8.2	3	2.1	15.1	25	17.4	41.4	114	79.2	19.0	144	1,386,000
Ohio.....	58	4.7	40.6	84	6.8	29.1	76	6.2	13.4	223	18.1	12.8	792	64.2	4.1	1,233	40,546,000
Oklahoma.....	1	0.6	8.4	3	1.8	17.1	9	5.4	23.5	55	33.8	43.0	95	58.4	8.0	163	2,885,000
Pennsylvania.....	247	6.8	53.9	234	6.4	19.2	286	7.9	12.0	872	24.0	12.1	1,997	54.9	2.8	3,637	171,880,000
South Dakota.....	3	1.3	13.1	11	4.7	24.1	24	10.4	28.5	68	29.3	28.3	15	100.0	100.0	15	10,000
Tennessee.....	...	...	...	...	...	...	9	20.5	39.2	27	61.4	56.7	8	18.1	4.1	44	6,040,000
Texas.....	10	26.3	60.7	8	21.1	27.2	6	15.8	10.4	2	5.2	1.0	12	31.6	0.7	38	1,187,000
Utah.....	19	9.7	59.7	12	6.2	15.5	20	10.2	12.1	50	25.6	10.8	94	48.3	1.9	195	4,720,000
Virginia.....	4	7.0	36.6	8	14.0	41.3	4	7.1	8.8	13	22.8	10.7	28	49.1	2.6	57	2,926,000
Washington.....	122	6.8	34.5	223	12.4	28.4	318	17.7	21.0	589	32.8	14.4	546	30.3	1.7	1,798	107,900,000
West Virginia.....	13	19.4	46.9	21	31.3	40.7	12	17.9	10.5	3	4.5	1.4	18	26.9	0.5	67	7,575,000
Grand total.....	748	6.4	47.1	935	8.1	23.2	1,175	10.1	14.9	2,743	23.6	12.2	6,021	51.8	2.6	11,622	564,157,000

(a) Note that this table represents mines, not companies, for which the showing would be much different.



Practical Pointers For Electrical And Mechanical Men



Locomotive Lamps Burn Out Because Circuit Supplies Two Voltages

Normally the Headlight Lamp Receives Only 9 Volts
But When the Main Fuse Blows 87
Volts Get to the Lamp

WHEN an electrical engineer works for a big mining company it is always difficult for him to make frequent trips to all of the mines he has in his charge. Another difficulty he has is to attend to all the troubles which are found when with much effort the infrequent visits are made.

Some men believe that most of the little troubles experienced by workmen are half imaginary and therefore should be forgotten, but here is a little story which shows how easily important details may be allowed to slide.

At one of our mines the locomotive men operating storage-battery locomotives complained that the headlight lamps were not satisfactory. Every once in a while, they claimed, the lights

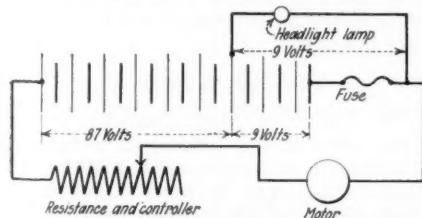


Fig. 1—This Circuit Subjects Lamps To Excess Voltage

Thus arranged the fuse does not protect the lamp. When the fuse blows and the controller is on, the headlight receives an 87-volt pressure. The circuit through the controller and motor causes the lamp to burn out.

would burn out, and they would find themselves in darkness. Of course, this provoked them, especially when they were far inside the mines where new lamps were not available.

When I realized what severe service most locomotives experienced I was not surprised when the motormen told me that their lamps frequently burned out. These were the first locomotives to be used at this mine, and I therefore thought that the motormen were expecting too much from their headlight lamps. I assumed that they expected them to last as long as lights used in the shops and that the only trouble they had was that the lamps failed to meet their unreasonable expectations. Besides, when I first heard this story I was on another mission to the mine and therefore did not have much time to look into the trouble.

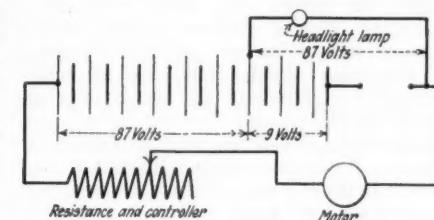


Fig. 2—How High Voltage Gets To Headlight Lamps

The supposedly perfect circuit in Fig. 1 now shows itself to be false. When the fuse is out the long end of the battery supplies voltage to the lamps and they pop.

However, I noted the complaint and took the first opportunity to visit that mine again. Much to my surprise the difficulty with the lamps had persisted, and the motormen had kept the old lamps so as to impress me by their number. I suppose I did not show enough concern on my previous visit, and they proposed to prove to me this time that they had not been making statements without justification. Sure enough they had plenty of old burned out lamps to show me and the requisitions for new ones were steadily increasing.

Apparently, something was wrong so a thorough investigation was started. One of the locomotives was nearby and the wires were traced from the battery to the headlights, the voltage was measured and proved to be correct and the lamps were lighted to their normal brilliancy. Where was the trouble? Everything looked all right. The lamps were receiving the voltage for which they were designed as testified by the

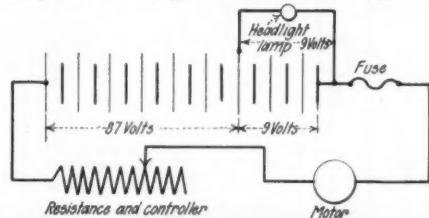


Fig. 3—Simple Change Corrects Lamp Circuit

By merely changing the connection of one wire from the load side of the fuse to the battery side the lamp is safe against high voltage coming from the other end of the battery whenever the main fuse blows.

voltage figure stamped on them. To prove that they would work satisfactorily at this voltage the electrician had previously connected one of the lamps to four spare cells, and it had been burning continually for over a month.

We were about to come to the conclusion that we had received a poor lot of lamps and that the only solution was to await the supply furnished on the next order in the hope that they would be all right. There wasn't much satisfaction in this idea because many consignments of lamps had been received and the results with all of them were the same.

Suddenly one of the motormen said something which was new. We had hounded every clue until I was sure we had not hit the right one and therefore anxiously picked up this last remark of the motorman. He said that his lamps burned out whenever he had an overload on his locomotive. Now how could this affect the lamps? We will see.

Fig. 1 shows the manner in which the battery, motor, resistance, controller and lamps originally were connected. Note that the lamp is connected near one end of the battery and the other terminal is connected to the load side of the main fuse. Now look at Fig. 2 and see what happens when the motor is overloaded and the main fuse blows. In that event, the motor stops, and before the controller can be shut off there is a circuit from the far end of the battery to the lamp through the resistance, controller and motor. Thus an 87-volt pressure is applied to the headlight. Bang goes the lamp and you can pick the pieces out of the headlight frame. So this is what caused the trouble.

It wasn't long before the circuits on all the storage-battery locomotives were changed over as shown in Fig. 3. Now when the fuse blows the lights remain on and do not burn out. E. E.

Decrease in Rope Diameter Sign of Weakness

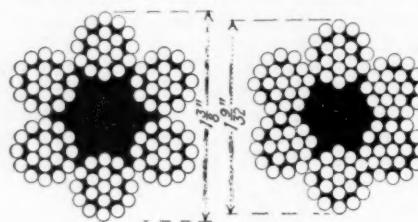
Most authorities on wire rope say nothing about inspection. A few mention that the number of broken wires which show up in so many feet of rope or in a rope lay is an indication of a reduction of strength. Only about one in ten point out that a decrease in overall diameter is another sign of weakness.

This feature was well illustrated recently at a shaft mine in West Virginia, where the rope broke while hoisting coal. The rope used at this shaft is a 13-in., 6 x 19 plow-steel cable

with a hemp core. In the regular inspections attention was directed to the items of lubrication, broken wires, and visible wear. The last inspection, made just before the break, disclosed the following conditions: Apparently the rope was well lubricated; there were no broken wires in sight; and the visible wear on the outside wires, due to friction on the drum and head sheaves, was not of sufficient magnitude to cause alarm.

BROKE UNDER NORMAL LOAD

In view of the apparent good condition of the rope it was a great surprise to have it break, and especially so while operating under normal load.



Hemp Core Almost Gone

Section drawings of the same piece of rope, one at a point near the break and the other a few feet from it. Deterioration possibly might have been detected by the reduction in diameter.

The actual break occurred in that part of the rope which was in contact with head sheave when the attached cage was at its lowest position. An examination of the broken rope showed that for a distance of approximately 10 ft. on each side of the break, the

hemp core had been crushed to pulp, and that many of the inner wires had been materially reduced in section by corrosion and wear of the strands against one another.

DIAMETER OF CORE REDUCED

Naturally, the question then arose as to how this weakened condition could have been detected by inspection. During the investigation the rope was caliperized at several points. The end sections were found to have retained practically their original diameter of 1 1/2 in. and in those sections the hemp core looked as good as new. However, that part of the rope, extending about 10 ft. each side of the break, was found to have been reduced in diameter to 1 1/3 in.

It will appear that if this reduction in diameter which was almost $\frac{1}{2}$ in., had existed prior to failure it might have been noticed by the inspector. However, unless suspected it is likely that he would not have detected it because of the rather gradual taper toward the point of smallest diameter.

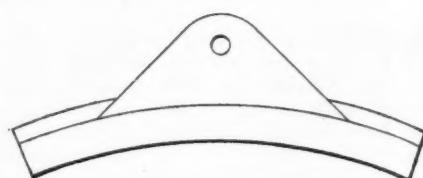
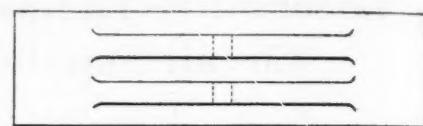
Repeated shocks not one of which would be sufficient to cause fracture may result in the failure of a rope. Suddenly applied loads approaching the elastic limit eventually tire out a rope and yet do not reduce its diameter until sometime a load, which ordinarily would not cause fracture, breaks it.

Nevertheless the experience in this particular case indicates that a thorough inspection, to determine the service conditions of hoisting rope, might well include measurements of the rope diameter.

mine track, as shown in the accompanying illustration. Brick walls and steel girders are used to support the roof.

One-Piece Brake Shoe Has Many Advantages

In spite of the many good features of a brake shoe and head cast into one piece, many of the repairmen at the mines have not had an opportunity to use them. In the sketch is shown the general outline of such a shoe. Usually it is made of cast iron or cast steel.



No Fussing with the One-Piece Locomotive Brake Shoe

Only one pin is required to hold this shoe in place, no adjustments of course are necessary to replace an old shoe with a new one.

Sometimes it is made with carborundum or steel inserts. Carborundum inserts should be placed so that they will grind off false flanges and keep them from forming. When steel inserts are cast into a shoe they are primarily intended to prevent the shoe from wearing too quickly.

SHOE FITS ANY WHEEL

No matter of what material the one-piece shoe may be made or whether it has inserts or not, it has the one advantage that it may be used on any of the four wheels of the locomotive, no rights or lefts are needed. Keys, screws, pins and bolts require no adjusting on this type of shoe and therefore it is easy to place on the locomotive. An old shoe can be taken off and a new one installed merely by knocking out the holding pin and replacing it in the new shoe. The ease with which this work can be done and the savings in time and labor which result, quickly make it desirable to change from the two-to-the-one-piece shoe. The motorman can replace an old shoe even though he may be far inside the mines if only he has one available. The fact that he is not compelled to carry both a right- and a left-hand shoe is a big advantage to him.

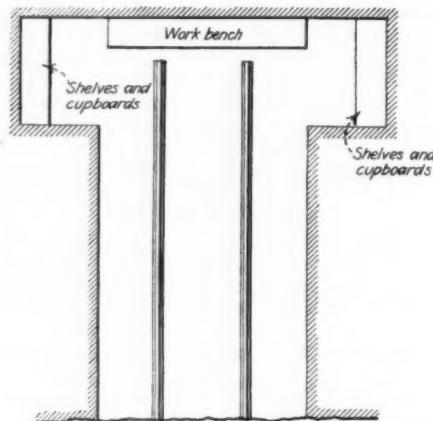
One large company using many different types and sizes of trolley locomotives changed the brake rigging on some of its locomotives so that this shoe could be used. Now only one type and size shoe is suitable for over 150 of its trolley type locomotives. Storage-battery locomotives use much smaller wheels and require a different size one-piece shoe.

Underground Shop Planned to Prevent Weakening of Roof

Where the mine roof is of such a nature that it requires much support, it is wise to build an underground repair shop much longer than it is wide, enlarging the inby end for the accommodation of a work bench, tools and supplies. The plan view of the shop might well have the form of a T with horizontal arms of such moderate length that the area spanned would not be great enough to weaken the roof and yet would be large enough to af-

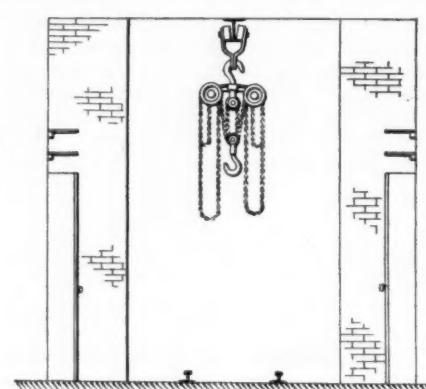
ford ample space for work. A shop like that just described was constructed in the Federal No. 1 mine of the New England Fuel & Transportation Co., Grant Town, W. Va. It is used chiefly for the repair of the undercutters, jackhammers and other compressed-air machines that are used extensively in this mine.

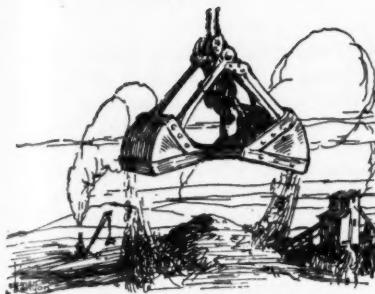
Small jobs can be done on the elevated platform adjacent to the bench at the same time as big jobs are being handled in the narrow section of the shop. An overhead crane travels on an I-beam in a direction parallel to the



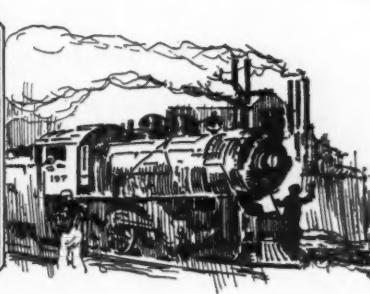
Tee-Ended Shop Convenient as Well as Safe

This shop has an unusual shape but apparently the design is well chosen, for it gives more working space and a more effective reach to the crane without necessitating greater floor space and without making it necessary to support the roof with pillars.





Production And the Market



Expected Upturn in Coal Market Slow to Appear; Prices Cease Downward Course

Rough weather is the missing element for which the coal trade now hankers, for business has practically settled down to a weather proposition. In some quarters the waiting policy adopted by consumers was attributed to a supposition that a revival hinged on the outcome of the election, but the upturn that was expected to follow the re-election of President Coolidge has been of minor consequence thus far. As a matter of fact the general business situation shows an improvement, as reflected in heavier production and larger orders for steel, continued gradual gains in textiles and increased exports. Overseas coal shipments, however, have fallen off badly. Car loadings continue well above the million mark, but one of the most encouraging factors is the large volume of orders for rolling stock being placed by the railroads.

Trade Lives on Hope

Though basic conditions are sound and sentiment is noticeably better, the trade is getting little nourishment in the way of actual returns, simply hanging in the belief that a taste of real winter will bring lagging consumers into the market with a rush. The ubiquitous Mr. Ford has broken out with a scheme for unloading coal from his Kentucky mines in the Northwest, and though not much is expected to come of it this year the dock operators are not exactly overjoyed at the prospect later on.

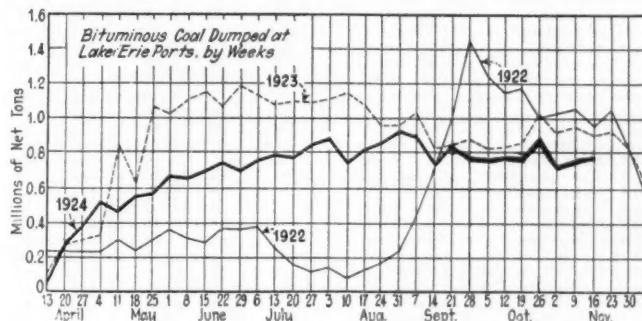
The hard-coal business continues a disappointment, demand being slow in the face of appeals and warnings to consumers against procrastination. The call for stove and chestnut holds steady, but egg and pea are moving only with some difficulty. Steam coals are quiet, barley being the best of the lot and No. 1 buckwheat the worst. Independent prices are holding their own fairly well, despite the recent boost in quotations.

Coal Age Index of spot prices of bituminous coal, after slipping for two weeks, came to a halt during the

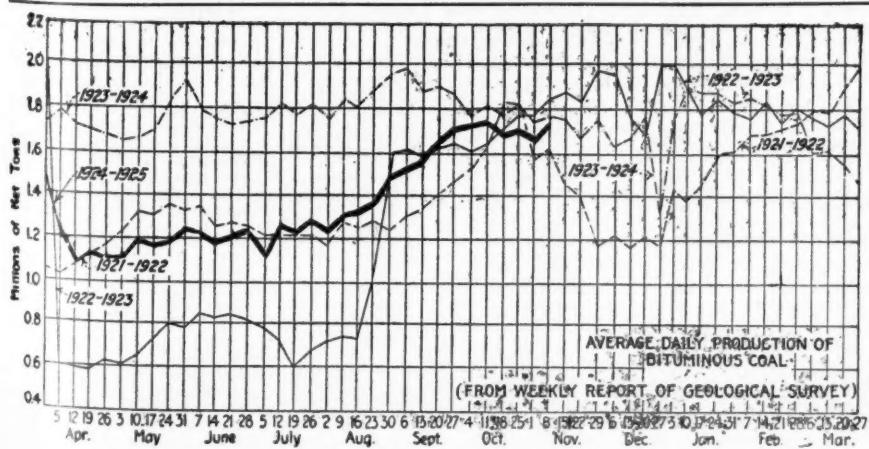
last week, standing on Nov. 17 at 170, the corresponding price for which is \$2.06, the same as the week before.

Activity at Hampton Roads registered a slight gain last week, dumpings of coal for all accounts during the seven-day period ended Nov. 13 totaling 356,603 net tons, compared with 325,568 tons the previous week.

There was a further increase in the movement of coal up the lakes, dumpings at Lake Erie ports during the week ended Nov. 16, according to the Ore & Coal Exchange, being as follows: For cargo, 753,405 net tons; for fuel, 30,875 tons compared with 704,538 and 30,937 tons respectively during the previous week.



Holidays again caused a decline in the production of bituminous coal during the week ended Nov. 8, when, according to the Geological Survey, 9,322,000 net tons was produced, compared with 10,065,000 tons in the preceding week, as shown by revised figures. The curtailment was due to the observance of All Souls' Day and election day. Allowing for the reduction in working time, the daily output actually was larger than during the previous week. Anthracite output, on the other hand, increased slightly during the week ended Nov. 8, 1,592,000 net tons having been produced, a gain of 148,000 tons over the preceding week, when the observance of Mitchell day cut heavily into production.



Estimates of Production

(Net Tons)

BITUMINOUS

	1923	1924
Oct. 25.....	10,919,000	10,300,000
Nov. 1 (a).....	10,547,000	10,065,000
Nov. 8 (b).....	10,726,000	9,322,000
Daily average.....	1,788,000	1,726,000
Cal. yr. to date.....	475,551,000	392,849,000
Daily av. to date.....	1,797,000	1,485,000

ANTHRACITE

Oct. 25.....	2,001,000	1,927,000
Nov. 1.....	1,328,000	1,444,000
Nov. 8.....	1,903,000	1,592,000
Cal. yr. to date.....	80,724,000	77,726,000

COKE

Nov. 1.....	266,000	150,000
Nov. 8 (b).....	255,000	140,000
Cal. yr. to date (c).....	16,129,000	8,301,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.

Midwest Idles Along

The weather simply is not rough enough for Midwest coal producers. Nothing else can be counted on to increase business and so nobody is inspired about trade. Of course there is some lump and egg business stringing along, but it is not large and most mines are unable to get more than three or four days a week and are troubled with fine coal even at that low production. Industrial pick-up is slowly going ahead but coal in storage and coal that has been contracted for the winter take care of about all the steam demand there is. Lump prices maintain themselves fairly well in most Illinois and Indiana fields but egg and 2-in. lump wabble. Even fine coal gets into distress these days.

West Kentucky is getting some trade throughout the Midwest and Northwest so that its output is cutting a considerable figure in steam and second class trade. Eastern Kentucky is moving into this territory in slightly larger volume because producers there see the end of the Lake season and are making extra efforts to sew up business elsewhere. They anticipate a real advantage over Midwest coals when the new lowered freight rates from the inner crescent region take effect. Pocahontas coal continues to move West in some volume but the tendency is toward price concessions, possibly because of the great amount of smokeless egg and mine run that reached the Midwest during the summer and early fall. No smokeless mine run

ever brings over \$2 now and most business is below \$1.75. Lump and egg has dropped from \$4.50 to \$4 as a minimum.

In southern Illinois railroad tonnage is unusually light. Mines are working from one to four days a week, depending upon this business. At a few of the biggest mines in southern Illinois there are mountains of screenings piled up on the ground, but this is about to end, for the cost of storing together with the cost of coal is running into figures that are amazing and there is always a danger of spontaneous combustion causing perhaps an entire loss. Some mines will suspend operations soon if conditions do not improve. Somewhat similar conditions prevail in the Duquoin and Jackson County fields except that no screenings are stored. Working time is poor and there is no market.

In the Mt. Olive district the movement goes with the temperature. A little coal is moving but nothing to speak of excepting railroad tonnage to the Northwest and a little steam and domestic to the Kansas City and Omaha markets. In the Standard field conditions are about as bad as they can be. Screenings have gone up to 75c., but 2-in. lump is down to \$2.20 and the other sizes are dragging.

Weather Is Hard on Kentucky

Although a good many Kentucky mines are fairly well sold up, some cheap tonnage is being offered, jobbers running into direct sales of mines at as low as \$2.75 on Harlan block coal, whereas some of the good mines are asking

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	Nov. 19 1923	Nov. 3 1924	Nov. 10 1924	Nov. 17 1924	Market Quoted	Nov. 19 1923	Nov. 3 1924	Nov. 10 1924	Nov. 17 1924	
Smokeless lump...	Columbus...	\$4.85	\$4.35	\$4.35	\$4.00@ \$4.25	Franklin, Ill. lump...	Chicago...	\$4.10	\$3.35	\$3.35	\$3.25@ \$3.50
Smokeless mine run...	Columbus...	2.15	2.25	2.05	1.75@ 2.25	Franklin, Ill. mine run...	Chicago...	2.50	2.35	2.35	2.25@ 2.50
Smokeless screenings...	Columbus...	1.30	1.30	1.35	1.20@ 1.35	Franklin, Ill. screenings...	Chicago...	1.45	1.35	1.35	1.25@ 1.50
Smokeless lump...	Chicago...	5.10	4.60	4.60	4.00@ 4.25	Central, Ill. lump...	Chicago...	3.10	2.85	2.85	2.75@ 3.00
Smokeless mine run...	Chicago...	2.25	1.85	1.85	1.75@ 2.00	Central, Ill. mine run...	Chicago...	2.10	2.20	2.20	2.15@ 2.25
Smokeless lump...	Cincinnati...	4.85	4.10	3.85	3.50@ 4.00	Central, Ill. screenings...	Chicago...	.85	1.10	1.25	1.20@ 1.35
Smokeless mine run...	Cincinnati...	2.10	2.00	1.90	1.75@ 2.00	Ind. 4th Vein lump...	Chicago...	3.35	3.10	3.10	3.00@ 3.25
Smokeless screenings...	Cincinnati...	1.35	1.15	1.15	1.10@ 1.25	Ind. 4th Vein mine run...	Chicago...	2.60	2.35	2.35	2.25@ 2.50
*Smokeless mine run...	Boston...	4.40	4.45	4.30	4.25@ 4.40	Ind. 4th Vein screenings...	Chicago...	1.20	1.30	1.45	1.40@ 1.50
Clearfield mine run...	Boston...	2.00	1.85	1.95	1.65@ 2.15	Ind. 5th Vein lump...	Chicago...	2.50	2.85	2.85	2.75@ 3.00
Cambridge mine run...	Boston...	2.60	2.20	2.40	2.00@ 2.65	Ind. 5th Vein mine run...	Chicago...	2.10	2.10	2.10	2.00@ 2.25
Somerset mine run...	Boston...	2.35	2.05	2.15	1.75@ 2.35	Ind. 5th Vein screenings...	Chicago...	.80	.95	1.10	1.00@ 1.25
Pool 1 (Navy Standard)	New York...	3.00	2.75	2.75	2.50@ 3.00	Mt. Olive lump...	St. Louis...	3.10	3.00	3.00	3.00
Pool 1 (Navy Standard)	Philadelphia...	3.00	2.70	2.70	2.50@ 2.90	Mt. Olive mine run...	St. Louis...	2.25	2.35	2.35	2.25@ 2.50
Pool 1 (Navy Standard)	Baltimore...	2.45	2.30	2.10	2.10@ 2.50	Mt. Olive screenings...	St. Louis...	1.25	1.10	1.10	1.00@ 1.25
Pool 9 (Super. Low Vol.)	New York...	2.25	2.10	2.10	2.00@ 2.25	Standard lump...	St. Louis...	3.05	2.75	2.75	2.75
Pool 9 (Super. Low Vol.)	Philadelphia...	2.30	2.15	2.15	1.95@ 2.35	Standard mine run...	St. Louis...	2.05	1.95	1.95	1.90@ 2.00
Pool 9 (Super. Low Vol.)	Baltimore...	2.05	1.80	1.70	1.65@ 1.80	Standard screenings...	St. Louis...	.55	.60	.60	.60@ .75
Pool 10 (H.Gr. Low Vol.)	New York...	2.00	1.90	1.85	1.75@ 2.00	West Ky. lump...	Louisville...	3.00	3.05	3.05	3.00@ 3.15
Pool 10 (H.Gr. Low Vol.)	Philadelphia...	1.85	1.75	1.75	1.65@ 1.90	West Ky. mine run...	Louisville...	1.65	1.60	1.60	1.50@ 1.75
Pool 10 (H.Gr. Low Vol.)	Baltimore...	1.90	1.65	1.55	1.50@ 1.65	West Ky. screenings...	Louisville...	.60	.65	.70	.75@ .85
Pool 11 (Low Vol.)	New York...	1.75	1.65	1.60	1.50@ 1.75	West Ky. lump...	Chicago...	2.85	2.75	2.75	2.50@ 3.00
Pool 11 (Low Vol.)	Philadelphia...	1.65	1.45	1.45	1.35@ 1.60	West Ky. mine run...	Chicago...	1.75	1.65	1.65	1.40@ 1.70
Pool 11 (Low Vol.)	Baltimore...	1.75	1.55	1.45	1.40@ 1.50						

High-Volatile, Eastern

Pool 54-64 (Gas and St.)	New York...	1.60	1.50	1.50	1.40@ 1.60	Big Seam lump...	Birmingham...	3.85	3.10	3.10	2.75@ 3.50
Pool 54-64 (Gas and St.)	Philadelphia...	1.65	1.50	1.50	1.40@ 1.60	Big Seam mine run...	Birmingham...	1.95	1.60	1.70	1.50@ 1.90
Pool 54-64 (Gas and St.)	Baltimore...	1.70	1.45	1.45	1.40@ 1.50	Big Seam (washed)...	Birmingham...	2.35	1.85	1.85	1.75@ 2.00
Pittsburgh sc'd gas...	Pittsburgh...	2.55	2.40	2.40	2.30@ 2.50	S. E. Ky. lump...	Chicago...	3.25	2.85	2.85	2.50@ 3.00
Pittsburgh gas mine run...	Pittsburgh...	2.25	2.10	2.10	2.00@ 2.25	S. E. Ky. mine run...	Chicago...	2.25	1.60	1.60	1.50@ 1.75
Pittsburgh mine run-(St.)	Pittsburgh...	1.90	1.85	1.85	1.75@ 2.00	S. E. Ky. lump...	Louisville...	3.50	3.25	3.25	3.00@ 3.50
Pittsburgh slack (Gas)...	Pittsburgh...	1.05	1.20	1.15	1.10@ 1.25	S. E. Ky. mine run...	Louisville...	1.85	1.45	1.60	1.50@ 1.75
Kanawha lump...	Columbus...	3.00	2.55	2.55	2.35@ 3.00	S. E. Ky. screenings...	Louisville...	.75	.95	.90	.85@ 1.05
Kanawha mine run...	Columbus...	1.85	1.55	1.55	1.40@ 1.75	S. E. Ky. lump...	Cincinnati...	3.25	3.00	2.60	2.50@ 3.00
Kanawha screenings...	Columbus...	.75	.95	1.00	.85@ 1.05	S. E. Ky. mine run...	Cincinnati...	1.50	1.55	1.45	1.30@ 1.65
W. Va. lump...	Cincinnati...	3.25	2.85	2.60	2.35@ 3.00	S. E. Ky. screenings...	Cincinnati...	.85	.90	1.00	.85@ 1.10
W. Va. gas mine run...	Cincinnati...	1.50	1.55	1.45	1.40@ 1.50	Kansas lump...	Kansas City...	5.10	5.00	5.00	5.00
W. Va. steam mine run...	Cincinnati...	1.50	1.45	1.30	1.30@ 1.45	Kansas mine run...	Kansas City...	3.50	3.10	3.35	3.25@ 3.50
W. Va. screenings...	Cincinnati...	.85	.90	.95	.85@ 1.10	Kansas screenings...	Kansas City...	1.00	2.00	2.00	2.00
Hocking lump...	Columbus...	2.90	2.55	2.55	2.40@ 2.75						
Hocking mine run...	Columbus...	1.85	1.60	1.60	1.50@ 1.70						
Hocking screenings...	Columbus...	.90	.75	.75	.65@ .85						
Pitts. No. 8 lump...	Cleveland...	2.55	2.40	2.30	1.95@ 2.85						
Pitts. No. 8 mine run...	Cleveland...	1.90	1.85	1.75	1.80@ 1.90						
Pitts. No. 8 screenings...	Cleveland...	1.05	1.00	1.00	1.05@ 1.15						

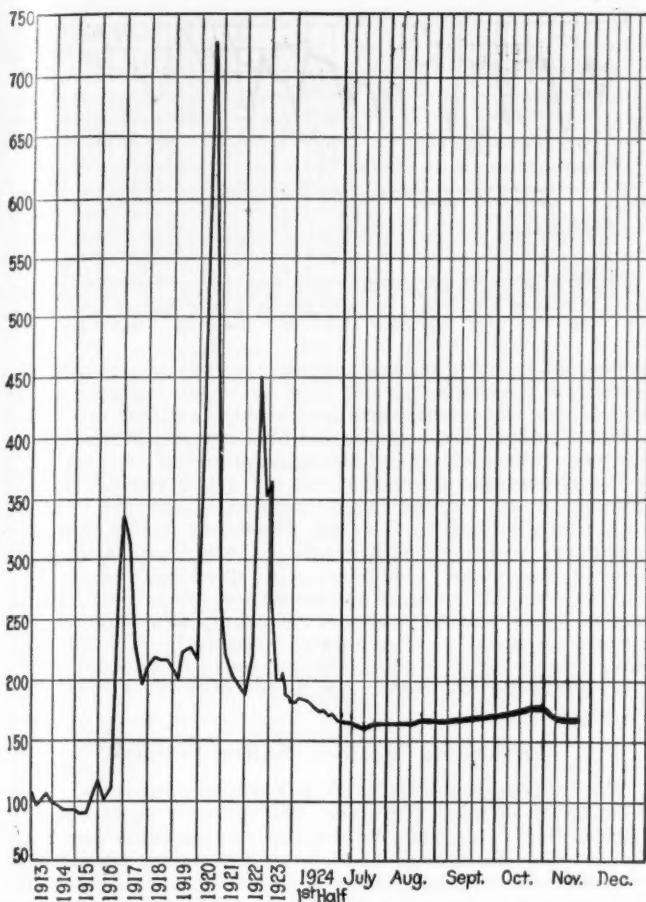
* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Nov. 19, 1923		Nov. 10, 1924	
			Independent	Company	Independent	Company
Broken...	New York...	\$2.34	\$9.60@ \$10.50	\$8.00@ \$9.25	.....	\$8.00@ \$9.25
Broken...	Philadelphia...	2.39	9.85@ 12.25	9.75@ 9.25	.....	9.15
Egg...	New York...	2.34	9.85@ 12.20	8.75@ 9.25	\$8.75@ 9.25	8.75@ 9.25
Egg...	Philadelphia...	2.39	9.85@ 12.20	9.45@ 9.25	8.80@ 9.25	8.80@ 9.25
Egg...	Chicago*	5.06	9.60@ 12.50	8.00@ 8.35	8.17@ 8.25	8.14@ 8.20
Stove...	New York...	2.34	9.85@ 12.25	8.75@ 9.25	9.75@ 10.50	8.75@ 9.50
Stove...	Philadelphia...	2.39	9.85@ 12.20	8.90@ 9.25	10.10@ 10.75	9.15@ 10.50
Stove...	Chicago*	5.06	9.60@ 12.50	8.00@ 8.35	8.63@ 8.75	8.30@ 8.64
Chestnut...	New York...	2.34	9.85@ 12.25	8.75@ 9.25	9.75@ 10.00	8.75@ 9.25
Chestnut...	Philadelphia...	2.39	9.85@ 12.20	8.90@ 9.25	9.85@ 10.50	9.85@ 10.50
Chestnut...	Chicago*	5.06	9.60@ 12.50	8.00@ 8.35	8.26@ 8.40	8.44@ 8.60
Pea...	New York...	2.22	6.50 @ 7.75	6.15@ 6.65	5.00@ 5.50	5.50@ 6.00
Pea...	Philadelphia...	2.14	6.75 @ 9.00	6.35@ 6.60	5.75@ 6.00	6.00
Pea...	Chicago*	4.79	6.00 @ 6.75	5.40@ 6.05	5.13@ 5.45	5.36@ 6.20
Buckwheat No. 1...	New York...	2.22	2.00 @ 2.50	3.50	2.00@ 2.50	3.00@ 3.15
Buckwheat No. 1...	Philadelphia...	2.14	2.25 @ 3.50	3.50	2.50@ 3.00	3.00
Rice...	New York...	2.22	1.50 @ 2.00	2.50	1.75@ 2.25	2.00@ 2.25
Rice...	Philadelphia...	2.14	1.75 @ 2.50	2.50	2.00@ 2.25	2.25
Barley...	New York...	2.22	1.00 @ 1.25	1.50	1.25@ 1.50	1.50
Barley...	Philadelphia...	2.14	1.00 @ 1.50	1.50	1.35@ 1.60	1.50
Birdseye...	New York...	2.22	1.60	1.35@ 1.60	1.60	1.60

* Net tons, f.o.b. mines. † Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924	1923	
Index	Nov. 17	Nov. 10	Nov. 3
Weighted average price	\$2.06	\$2.06	\$2.07
			\$2.21

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

\$3@\$3.50 for prime block coal. However, there isn't much block moving at over \$3@\$3.25 due to mild weather and heavy production. It is believed that with cessation of Lake movement the heavy production of West Virginia and Kentucky non-union mines will meet with harder competitive conditions, which may make for slightly weaker prices, unless there is some really cold weather soon. Demand, which had been expected to improve right after election, hasn't picked up much as yet. Western Kentucky block and lump sizes have been a little weaker as a result of larger production, good traffic conditions and mild weather. Screenings also are about 10c. a ton higher than they have been, as a result of lighter production of prepared sizes. Mine run is rather draggy. Operators have been developing a better demand for small steam nut sizes, and almost all screenings are now being run down to pea and slack.

Despite the strike in Muhlenberg County, output in western Kentucky is around 55% per cent of capacity. Prices show 6-in. block coal, \$3; lump and egg, \$2.50@\$2.75; nut, \$1.60@\$2.25; mine run, \$1.50@\$1.75; and screenings, 75@85c.

Northwest Has Some Cold

At Duluth cold weather and a touch of snow have had a salutary effect on the coal market and the docks are now working full time getting out orders. Features of the market are the failure of the supply of Pocahontas lump and the sharp drop in hard-coal receipts. Pocahontas is literally sold out in desirable sizes. The supply of hard coal is large, but there is little demand for it as yet, except from Dakota, which has come into the market stronger than in five years; nevertheless prices hold firm. Bitu-

minous holds as quoted last week. The general trend, however, is for strength.

Last week 37 cargoes were received at Duluth, of which one was hard coal, and 10 are reported on the way, of which only one is anthracite.

Cold weather has finally arrived in the Twin Cities and has helped to start long delayed buying. But unless the cold weather continues for a few days the effect will be short-lived, as the habit of buying for urgent needs only is not easily overturned. Dock prices are holding steady at former prices. All-rail prices are somewhat firmer, with southern Illinois lump at \$3.25@\$3.50, western Kentucky lump \$3 and central Illinois lump \$2.75.

Last week's Milwaukee report covers the situation there today. Coal is coming to Milwaukee quite steadily but it is not moving out again as freely as dealers would have it. Colder weather is needed. Receipts by lake and rail up to Nov. 1 total about 1,000,000 tons less than for the same period last year, but there was a holdover of about the same amount last spring.

West Depends on Weather

Demand in the Southwest continues weak, but so close has been buying by retailers that brief cold spells produce immediate orders. Prices are a bit firmer than last week. There is small surplus of screenings, as the slump in demand for domestic grades afforded an opportunity to rid tracks of oversupply accumulated early in the season.

A slight decrease in domestic coal output was noticed last week in Colorado, due to continued warm weather. However, it seems reasonable to believe that with the first spell of winter weather everyone will be extremely busy because of low stocks. Colorado mines worked 31 hours last week with 24 per cent of working time lost attributed to "no market." Prices have not changed since Oct. 20.

A cold snap in Utah has increased coal production in that state, but average working time is still only around three and a half days a week. The demand in regard to sizes of coal is well balanced again, but there is a slight tendency to a shortage of slack.

Softness Prevails in Ohio Markets

Cincinnati yearns for a touch of cold weather. The market is soft, slack and mine run being about the only sizes able to hold their own. Car interchange fell off nearly 1,000 during the week. Smokeless business is feeling the effects of the slowing up with New River, Dry Fork and other of the coals in this category selling below standard Pocahontas. The long dry spell has hit river business hard and practically all the retailers have caught up on orders. Some are offering inducements to encourage buying.

Both the domestic and steam trades are exceedingly dull at Columbus. Dealers are waiting for lower temperatures before placing orders and steam users also are playing a waiting game. Prices have weakened perceptibly and production also has suffered. Cancellation of orders placed during the short boom of several weeks ago is throwing much distress coal on the market. Pocahontas and other smokeless varieties are weaker and a price decline of 25c. a ton is reported. Splints also are weaker. Utilities are using a fair tonnage and railroad consumption is slightly better, but general manufacturing has not improved to any extent. Screenings are weak because of the large output and the fact that lake trade is nearly ended.

While no significant change has taken place in the demand for bituminous coal at Cleveland there is not as large a quantity seeking disposition as there was a week ago, and because of this, spot prices have rebounded 5c. to 10c. from the extreme low figures of last week. The mild weather has cut into lump production and the Lake shipping from the mines is dwindling. These two factors have caused a reduction in the quantity of slack being produced, inquiries for which are rather active.

Selling Difficult at Pittsburgh

Demand for coal at Pittsburgh has increased only slightly since election. Accumulation of coal on track has caused curtailed production at many mines. Consumers having arrangements for regular shipments have been taking coal much the same as formerly, but the open market demand has been very poor. Prices remain stationary despite the extreme difficulty of effecting sales.

The situation at Buffalo does not change much. Considerable coal was shipped here just before election by

sanguine operators, with the idea that the election alone would have sufficient influence to effect a sale of it. It did not. Shippers complain that the demand is not as good as it was last month. The principal reason is absence of cold weather. The Canadian trade is still poor. Some jobbers are staying out of it, for they say prices have to be very low to compete with Dominion coal. Little is doing in the lake trade.

Demand at Toronto is somewhat better and is improving steadily. Pennsylvania smokeless sells for \$5.85, steam lump at \$6.40, and slack at \$5 in carload lots, delivered.

New England Yearns for Industrial Pick-Up

If anything, the New England market is easier and buyers are less in evidence. Certainly the Hampton Roads agencies have about given up hope of higher prices for the present, so few sustaining factors are there in the current market. Industrially there is no snap, and more than a few lines of business are muddling along with no bright prospect. Recent purchases of textile plants by rubber tire producers have caused comment, but the mills acquired are relatively small and the change in ownership will have little effect on cloth manufacturing as a whole. Meanwhile, steam coals are only in light request.

At Hampton Roads there are again small accumulations, but as yet there has been no pronounced dip in price, \$4.25 @ \$4.40 continuing about the range for Navy acceptable grades, with No. 2 coals selling off to the extent of 15@25c. Slack can still be had at minimum figures, and of this there is a fair amount of buying by consumers with automatic stokers. Offshore there is mild inquiry in response to the slight improvement in British trade, but not yet have there been purchases of any magnitude. What this year amounts to an average coastwise movement is about all that can be said for trade in this territory.

For inland delivery at Boston \$5.40@\$5.50 is about the present level on cars, with Portland and Boston commanding figures a trifle higher. Pocahontas and New River have the call from points well into the interior.

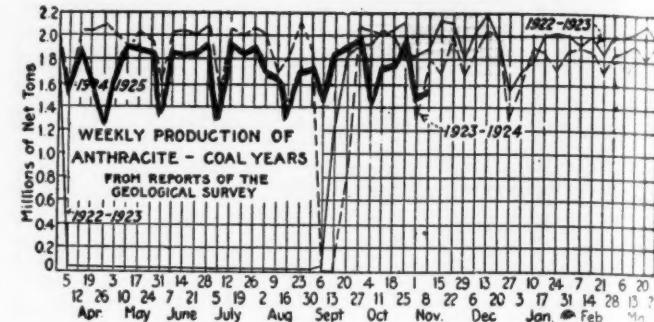
No developments can be seen in coals from central Pennsylvania; prices are on a cost basis.

Atlantic Markets Quiet but Hopeful

General industry has not picked up sufficiently to increase the demand for soft coal at New York. Buyers continue to view the situation at a distance and are buying only for immediate requirements. Consumption is practically at rock bottom. The situation along the line and at tidewater shows comparatively no change from last week, either in prices or demand. Receipts at the piers show an increase in the average number of cars on hand and as a result there has been an oversupply at times, but not enough to drive prices to a lower level. Some consumers are taking one or two car lots when the price and quality of the coal are right.

The Philadelphia trade is more hopeful; inquiries are heavier and a larger proportion than usual is developing into orders. Consumers who have been buying at the market for months are inquiring as to contracts and a fair amount of business has been closed to April 1. General business conditions seem to be looking up. There is still a good supply of slack, due to the increased screening of coal, especially of the gas grades. The market at tide continues quiet.

The Baltimore coal trade is optimistic. The passing of the election followed by a brisk rise in the stock market leads



some coal men to believe that money will be released for industrial development, and that this will tighten up the coal trade. Meanwhile demand is only fair and prices are extremely low. Exports for the first two weeks of November have fallen far behind the same period of October.

The Birmingham market shows no material change. Domestic trade is suffering on account of adverse weather, both the wholesale and retail movement being slow and consumers showing indifference. There is a fairly good demand for steam, comparatively speaking, but neither inquiries nor sales are up to normal for this season. Prices in the steam market are unsatisfactory, affording a small margin of profit to the mines. Output for the week of Nov. 1 is reported as 355,000 net tons. Industrial conditions generally are showing a more favorable aspect since the election.

Anthracite Markets Suffer Setback

The anthracite market at New York lacks activity. There is a steady demand for stove and chestnut coals but producers find it difficult to dispose of egg and pea sizes easily. The situation is dull, notwithstanding the appeals sent out to consumers to stock up while coal is available. Weather conditions are against consumption and consumers are not willing to buy until forced to. There is not much activity in the steam coals, No. 1 buckwheat lagging the most. Barley is in the best shape.

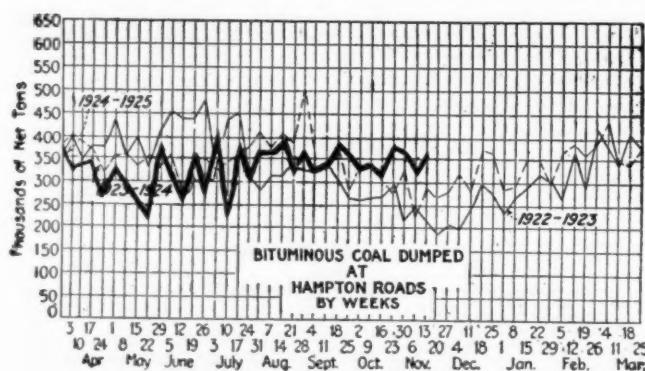
The retail trade at Philadelphia lost much ground this week, due to continued mild weather. Producers have practically enough orders on their books to absorb output, due to the October shortage. Egg is weakening, pea shows signs of dragginess and the demand for stove is beginning to run off, but nut is moving well. There are signs of weakness in the retail price situation, despite the fact that independent mine prices have generally risen.

Anthracite business at Baltimore continues rather listless because of the continued mild weather and the fact that many householders have now adopted the plan of buying in two-ton lots over the winter, as coal is needed, instead of placing in entire stocks in the fall or early winter. In order to combat oil-burning devices the trade is arranging to exhibit a buckwheat-burning furnace with mechanical blower attached. The yards are fairly well stocked.

Demand at Buffalo accords with the weather. Probably not more than half the amount of anthracite has been laid in here by consumers since last spring that ordinarily goes in in the same time. The families are burning natural gas, the schools and quite a good many other plants that once used anthracite to cut out the smoke, are using smokeless coal and they will never go back to the old fuel. The anthracite companies urge the use of small sizes, but are doing nothing, at least here, to introduce it. The demand for coke is as light as ever.

Owing to the prolonged spell of warm weather, demand for hard coal at Toronto is rather light. Anthracite is still retailing at \$15.50 and in plentiful supplies, but there is some scarcity of stove coal. No shortage is expected this winter, though.

Car Loadings, Surplusages and Shortages



Week ended Nov. 1, 1924.....

Previous week.....

Week ended Nov. 3, 1923.....

	Cars Loaded	
	All Cars	Coal Cars
Oct. 31, 1924.....	1,073,430	181,718
Oct. 22, 1924.....	1,112,345	193,736
Oct. 31, 1923.....	1,035,776	179,714

	Surplus Cars		Car Shortage
	All Cars	Coal Cars	
Oct. 31, 1924.....	99,190	49,058	.....
Oct. 22, 1924.....	94,153	46,476	.....
Oct. 31, 1923.....	24,477	7,205	12,336 3,068

Foreign Market And Export News

British Steam Coal Trade Perks Up; Output Above 5,000,000 Tons

The Welsh steam coal market has brightened somewhat, though a considerable extension of the present business is necessary before the market can be restored to normal. European inquiry has expanded, coaling depots abroad are showing a greater interest, and there also has been inquiry from other directions. The business booked, however, is not sufficient to keep the collieries busy, and during the past week 6,000 more men were thrown out of work. Curtailed output in conjunction with the slight increase in business has enabled the operators to maintain their prices.

The French Ministry of Marine is in the market for 43,000 tons best Admiralty large.

The Newcastle market has had a relapse from last week, and is flat and depressed. Shipments are very slow and operators are taking low rates for their coal. The Lithuanian State Railways are asking for 30,000 tons of steams, but otherwise there is no business to speak of. German competition abroad is keenly felt and the outlook is generally regarded as very unsatisfactory.

Production by British collieries during the week ended Nov. 1, a cable to *Coal Age* states, totaled 5,043,000 tons, according to official reports. This compares with 5,061,000 tons produced during the preceding week.

Hampton Roads Market Quiet; Foreign Trade Declines

The market at Hampton Roads is quiet, with bunkers and coastwise business only fair and with foreign movement rapidly on the decline. Nothing but extremely cold weather would give the market any stimulus, in the opinion of the trade.

Prices have softened and supplies at tidewater are somewhat lower, due to

lack of movement from the mines rather than to movement over the piers. The outlook for an immediate pick-up in business is not considered bright.

The tone of the market is dull, high-volatile coal alone holding its own. Inquiries have slumped and the spot market is more inactive than for the last six weeks.

French Markets Change Slightly As Mild Weather Lasts

The French industrial and domestic coal markets are practically unchanged since the beginning of the autumn. Due to mild weather, the consumption of house coals is low and some varieties of smalls and screened fuels are easier because of lack of demand. Imports from South Wales have been lower of late. Deliveries of semi-bituminous and sized products from Belgium, however, show a little more animation.

Canal freight is maintained at 25 fr. Béthune-Paris and 9.75-10 fr. Rouen-Paris.

Deliveries of indemnity fuels during the first twenty-six days of October to France and Luxembourg were 406,800 tons of coal, 288,800 tons of coke and 31,800 tons of lignite briquets, a total of 727,400 tons.

From Oct. 1 to 28 the total supply of coke to the O.R.C.A. amounted to 253,349 tons, a daily average of 9,050 tons. The M.I.C.U.M. having ceased its functions in the Ruhr on Oct. 28, deliveries of coke on the 29th were only 1,855 tons through Ehrang and 5,207 tons through Aix and on the 30th 1,576 and 2,917 tons respectively, a total of 11,555 tons for the two days. Since the 30th the German supply of reparation coke has practically stopped. French metallurgists, however, have enough fuel to live on until the fixation of the delivery programme by the Reparation Commission. If France's claims are

recognized she will get a supply of from 300,000 to 400,000 tons a month.

The output of coke in the French northern collieries is being intensively developed. The Courrières coal pits, where coke production has been hitherto unknown, are erecting 90 ovens of a capacity of 140,000 tons a year; 140 new ovens are under construction at Lens; the Noeux collieries are raising their annual production by 120,000 tons while the Aniche mines will hereafter produce 300,000 tons of coke annually.

Export Clearances, Week Ended Nov. 15, 1924

FROM HAMPTON ROADS

	Tons
Dan. Str. Hans Jensen, for Montreal	5,827
Ital. Str. San Giuseppe, for Three Rivers	6,985
Amer. Schr. Mary H. Siebold, for St. Georges	2,383
For Cuba:	
Br. Str. Berwindmoor, for Havana	9,608
For Egypt:	
Br. Str. Titan, for Port Said	3,566
For Italy:	
Ital. Str. Labor, for Genoa	5,723
Ital. Str. Robilante, for Porto Ferrajo	9,149
Ital. Str. Bosso Platave, for Savona	6,440
For West Indies:	
Jap. Str. Wales Maru, for Curacao	6,989
Amer. Schr. Susan B., for St. Stephens	600

FROM PHILADELPHIA

	For Cuba:
Am. Str. Peter H. Crowell, for Havana	—
	FROM BALTIMORE
	For Porto Rico:
Am. Str. Delfina, for Puerto Real and Yacubroa	788
	For Italy:
Ital. Str. Enrico Toto, for Leghorn	6,736
	For Ecuador:
Br. Str. Arana, for Guayaquil	1.053

Hampton Roads Pier Situation

	Nov. 6	Nov. 13
N. & W. Piers, Lamberts Pt.:		
Cars on hand	1,215	949
Tons on hand	74,356	58,587
Tons dumped for week	96,083	117,017
Tonnage waiting	12,000	4,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,731	1,706
Tons on hand	123,250	113,550
Tons dumped for week	108,842	109,911
Tonnage waiting	10,909	12,000
C. & O. Piers, Newport News:		
Cars on hand	1,950	2,220
Tons on hand	101,355	116,770
Tons dumped for week	87,547	91,468
Tonnage waiting	8,810	19,510

Pier and Bunker Prices, Gross Tons

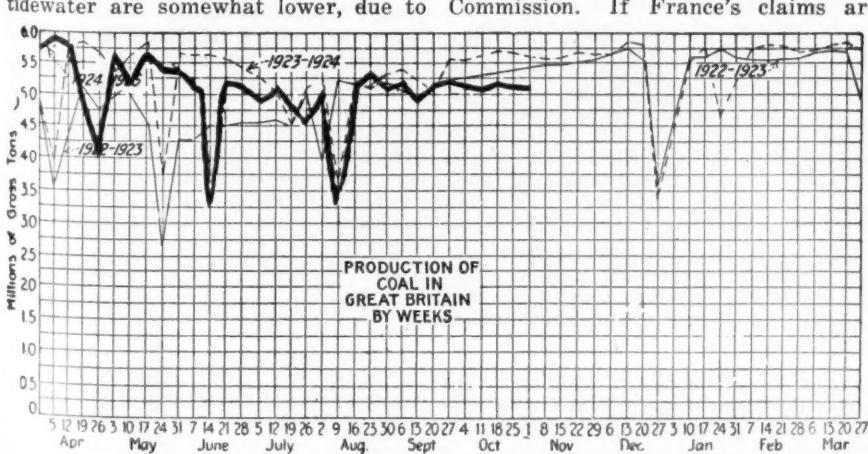
	PIERS	Nov. 8	No. 15†
Pool 9, New York...	\$4.75@ \$5.00	\$4.75@ \$5.00	
Pool 10, New York...	4.65@ 4.80	4.50@ 4.75	
Pool 11, New York...	4.40@ 4.55	4.40@ 4.55	
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia...	4.45@ 4.70	4.45@ 4.70	
Pool 11, Philadelphia...	4.30@ 4.50	4.30@ 4.50	
Pool 1, Hamp. Roads...	4.25	4.20	
Pool 2, Hamp. Roads...	4.15	4.10	
Pools 5-6-7 Hamp. Rds.	4.00	4.00	
	BUNKERS		
Pool 9, New York...	\$5.00@ \$5.25	\$5.00@ \$5.25	
Pool 10, New York...	4.90@ 5.05	4.75@ 5.00	
Pool 11, New York...	4.65@ 4.80	4.65@ 4.80	
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia...	4.75@ 4.95	4.75@ 4.95	
Pool 11, Philadelphia...	4.50@ 4.70	4.50@ 4.70	
Pool 1, Hamp. Roads...	4.35	4.30	
Pool 2, Hamp. Roads...	4.20	4.20	
Pools 5-6-7 Hamp. Rds.	4.10	4.10	

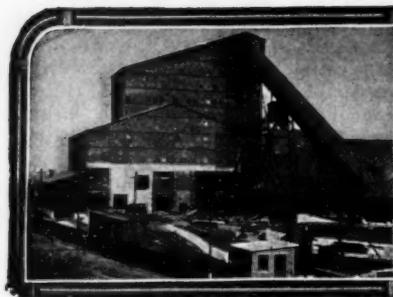
Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to *Coal Age*

Cardiff:	Nov. 8	Nov. 15†
Admiralty, large...	27s. @ 27s. 6d.	27s. @ 27s. 6d.
Steam smalls....	16s.	16s. @ 17s.
Newcastle:		
Best steams.....	18s.	18s. 3d. @ 19s. 6d.
Best gas.....	21s. @ 21s. 6d.	20s. 6d. @ 21s.
Best bunkers.....	17s. 6d. @ 18s. 6d.	18s. 6d. @ 19s.

†Advances over previous week shown in **heavy type**, declines in *italics*.





ALABAMA

The consummation of the merger of the properties of the Sloss-Sheffield Steel & Iron Co. and the Alabama Company awaits only the ratification of the directors of the respective companies, such approval being expected this week.

Rumors are current in the Birmingham district that important developments in the way of additions and betterments at local plants of the Tennessee Coal, Iron & Railroad Co. will soon be announced.

The Edgewater mine of the Tennessee Coal, Iron & Railroad Co., the largest colliery in the Alabama field, produced a record tonnage of 127,825 tons in October as against record of 104,562 tons mined in August. The blast furnaces of the Tennessee company broke all previous records with an output for the month of 127,925 tons.

COLORADO

The Rocky Mountain Fuel Co. is said to be concentrating its production largely in the Columbine mine, in the northern Colorado field, and in the Southwestern mine, near Aguilar, in the southern part of the state.

The Bluff Springs Coal Co., which has worked one or two properties near Canon City, is about to open the old Donnelly slope near Coal Creek. The mine has been rehabilitated and electrified.

Fred Farrar, according to newspaper reports, is to retire as executive vice-president of the Colorado Fuel & Iron Co., to re-engage in general practice of law, but will continue as general counsel for the company. The announcement comes from President J. F. Welborn. Mr. Farrar is one of the foremost members of the Colorado Bar. He has been practicing law in the state twenty-three years. From 1913 to 1916 inclusive he was Attorney General of the state. In July, 1918, he became general counsel for the Colorado Fuel & Iron Co.

Local strikes have caused some lost time recently in the Walsenburg region. At Morning Glory mine the men struck rather than pay \$2 for the recharging of cap lamps. At Pictou the force walked out because two men were fired for inhumane treatment of a mule.

The Colorado Fuel & Iron Co. in a movement toward concentration of production, has closed three mines in the Trinidad field employing over 600 men and producing approximately 50,000

tons of coal per month. The mines are Sopris No. 2, with a personnel of about 317 men and a monthly production of 25,000 tons; Tabasco, 193 men, 17,000 tons monthly, and East Side Primero, with 92 men. The entire Primero mine produced about 13,000 tons monthly; East Side was the major operation.

The Victor American Fuel Co. has just reopened Radiant mine, in the Canon City field, in Fremont County. Radiant, a commercial producer, has been closed since last March. It employs 150 miners.

ILLINOIS

The Benton Coal Co. has opened its No. 1 mine near that city and will operate steadily, employing between 500 and 600 men. The mine is one of the first in the Benton district to resume work.

Harry F. Goodnow, formerly chief mining engineer for the Majestic Coal & Coke Co., and later superintendent of the Crerar-Clinch properties at Johnston City, is now connected with the Gayle Coal Co., at Du Quoin, a new stripping operation operated as a subsidiary of the two former concerns.

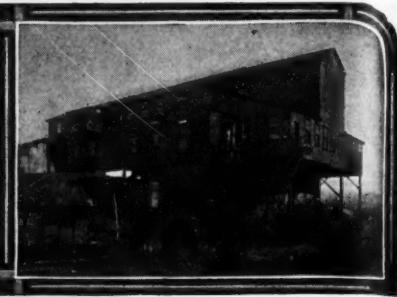
The large wash house at Mine No. 14, Old Ben Coal Corporation, Buckner, was destroyed by fire last week. The building was constructed of brick, with a tile roofing and was considered almost fireproof. Officials of the mine are at a loss to determine the origin of the fire.

The records of both Zeigler mines were again broken in October with a total production of 313,644 tons. Zeigler mine No. 1 has produced in the last eighteen years a total of 12,632,615 tons.

Two Williamson County strip mines in the vicinity of Carterville have been reopened upon a full time schedule. Weaver mine No. 20 plans to resume operations soon, after having been closed down since last November.

A cage at Orient No. 2 mine of the Chicago, Wilmington & Franklin Coal Co., loaded with thirty-six miners was dumped at the top of the tipple Nov. 7 at the end of a day's work, throwing the men into the weigh hopper about 30 ft. below. Only three men were injured seriously enough to require hospital attention.

John Meyer, assistant foreman of the large Kathleen mine of the Union Colliery Co., at Dowell, has resigned on account of ill health, and has gone to St. Louis to live with his family.



INDIANA

H. Clarence Bean, formerly with the Jewel Coal & Mining Co. and the Sterling-Midland Coal Co., with operations in Illinois, has been made general superintendent over three mines of the Coal Bluff Mining Co., at Terre Haute. The three mines are all in operation at present.

The Brazil Collieries Co., at Brazil, has filed a final certificate of dissolution.

The Wheatland Standard mine, at Bicknell, which has been closed down for several weeks in a controversy over the installation of a loading machine at the mine, probably will resume work soon, officials say. As a result of a conference held in Indianapolis last week, at which Wheatland miners were delegates, it was agreed that the mines keep the machines in operation during the testing stages. Later a meeting will be called to arrange a permanent wage scale.

Fire which was discovered Nov. 7 in the Indian Creek mine, at Bicknell, has caused the sealing of the mine with the possibility that it will not work again for many weeks. The men working at the mine "skinned up" and the fan was stopped Friday night to permit a change from steam to electric power. On Nov. 11, however, the mine boss discovered the fire and also evidences of an explosion. In a way it is believed to have been both harmful and helpful that the fan was down. Had it been operating, it probably would have blown out the smoke and caused the fire to be discovered sooner. But, had it furnished oxygen to the explosion, it might have caused a blast of much greater proportions.

D. C. Stephenson, former grand dragon of the Ku Klux Klan in Indiana, has announced the sale of the Central States Coal Co. to L. G. Julian, of Evansville, for a total sum, he said, of \$200,000. He has accepted a position as general manager of a New York firm at a salary of \$25,000, he said. He refused to give the name of the company. He said also that he had caused to be written into the contract for the sale of the company a provision that the company could not sell its product to the state during the term of the next Governor.

Carl J. Fletcher, vice-president of the Knox Coal Mining Co., has been named receiver for the J. & I. Coal Co., of Indianapolis. The appointment was made on petition of the E. & J. Coal Co., plaintiff in a suit to foreclose a \$3,500 mortgage on the J. & I. property. The appointment of a receiver

was asked pending hearing of the suit. Owners of the defendant company are John D. Johnson, Willard E. Jackson and Catherine Shearman.

KANSAS

A further effort to lay the Alexander Howat ghost in District 14, United Mine Workers, is contained in a letter by the district board to locals, reiterating the recent warning by President Lewis that Howat is ineligible for the presidency of the district and declaring that Howat's name and the names of his associates will not appear on the ballot for the December election. Many locals have disregarded Lewis's message and have placed Howat in nomination for the office. In its supplementary letter the board warns of the possibility of the district again losing its autonomy, as it did in 1921, following the outlaw strike called that year by Howat, then president, and his associates.

KENTUCKY

L. W. Fields, of Lexington, and associates have purchased a large tract of coal and timber land in Letcher County.

Shelby Elliott, 26, president of the Big Four Coal Co., Louisville, is recovering from injuries received in a recent motor accident in which a car that went dead blocked the road and caused a triple collision in the dark.

Forest fires in Kentucky have caused a great deal of damage and some of the coal companies have lost a lot of timber, but no mine buildings have been burned. Early frosts were followed by weeks of dry weather, and the country was brown and dry. The West Kentucky Coal Co., in western Kentucky, is reported to have suffered some timber loss.

The Elkhorn Coal Co. is about to begin erection of a \$20,000 store building in Master.

The Hamilton Mining Co., Cromwell, Ohio County, western Kentucky, recently reported that cables furnishing current to the mine had been cut during the night of November 4, putting the mine out of commission until the

breaks were located and splicings made. The company is operating in spite of the union strike in nearby Muhlenberg and Hopkins counties.

OHIO

The tipple of the Eagle Coal Co. mine, south of Zanesville, was totally destroyed by fire recently, entailing a loss of about \$75,000. All of the equipment was destroyed and the mine will be out of commission for some time. The flames caught from a fire in a woods adjoining the tipple.

Officials of the Middle States Coal Co., of Columbus, are making an exhaustive investigation of the dynamiting of tipples No. 24 and No. 68 on its property in the Hocking Valley, which occurred several weeks ago. One of the tipples together with the power plant and all equipment was totally destroyed. Arrests will follow if the investigation reveals the culprits.

PENNSYLVANIA

Lee, Higginson & Co. and Cassatt & Co. are offering a new issue of \$5,000,000 South Penn Collieries Co. first mortgage sinking fund Series A 6 per cent bonds, due Nov. 1, 1944, at 94½ and interest, to yield over 6½ per cent. The bonds are secured by a first mortgage on all fixed properties and leaseholds of the company.

Directors of the Glen Alden Coal Co. have declared a dividend of \$3.50 a share, payable Dec. 20 to holders of record Nov. 29. An initial dividend of \$1.50 a share was paid Dec. 20, 1922. A payment of \$2 was made June 20, 1923, and one of \$2.50 was made Dec. 20, last year. On June 30 last, \$3.50 a share was paid.

Announcement has been made that the firm of Peale, Peacock & Kerr, Inc., leading coal operators in central Pennsylvania, with offices in Philadelphia and New York city, have purchased from Mrs. Anne W. Penfield, of Philadelphia, formerly of Williamsport, 5,000 acres of coal land holdings in English Centre, Lycoming County. The engineer's report shows that there are 30,000,000 tons of bituminous coal under the sur-

face of the land bought and it is proposed to mine the coal and market it by building a railroad from the mines to Cedar Run, on the New York Central R.R. Mrs. Penfield still has 10,000 acres of coal land in the same vicinity. Rembrandt Peale, senior member of the purchasing firm, resides in St. Benedict, Clearfield County.

Robert H. Lansburgh, new Secretary of Labor and Industry, in announcing his policy for the conduct of his department, notified inspectors that they must devote seven hours to actual work a day five days a week and three hours on Saturday. Inspectors were told they can recommend any safety devices endorsed by the department and the State Industrial Board, but that they may not pick out any one device for special recommendation.

The Wolfe Coal Co. will soon open a new stripping operation near its mines between Lattimer and Drifton and has awarded the contract for the operations to the Schraner Construction Co., of Scranton. A steam shovel will be moved from the present operations to the new job next week.

Committees representing each of the five Pennsylvania districts, United Mine Workers, were appointed at a meeting at Harrisburg, Nov. 12 of the various executive committees, to study the mining laws with a view to making certain recommendations to the next Legislature. The committees are to determine what legislation, in their opinion, is needed and report at a general conference prior to the meeting of the General Assembly. The conference date will be determined later.

Orders have been issued to blow in immediately 340 additional ovens at the H. C. Frick plants at York Run, Phillips, Collier, Continental No. 1 and Hecla. It is understood that more ovens will be placed in operation soon.

The Mahanoy Valley Coal Co., idle the past few months, has resumed operations at its washery at Girardville, adding another feeder to the tonnage which the Hazleton & Mahanoy Division of the Lehigh Valley R.R. sends to the anthracite markets.

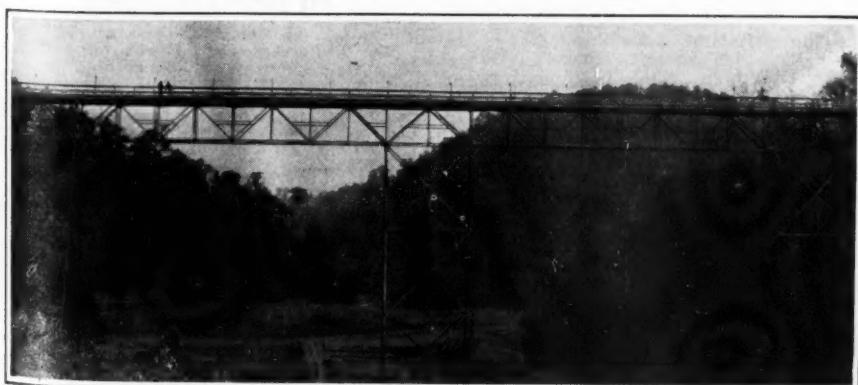
UTAH

J. A. Stallings, sales manager of the Spring Canyon Coal Co., who has been seriously ill for some months, is much improved and is now able to spend a short time in his office each day.

L. C. Karrick, a Salt Lake City engineer, has been appointed to take a part in the research work started by the Carnegie Institute of Technology which has for its purpose the elimination of the smoke problem in large cities.

George H. Dern, who has been chosen next Governor of Utah, is a prominent Salt Lake City mining engineer.

Sam Woodhead was re-elected county commissioner of Carbon County over T. A. Stroup, superintendent of the Clear Creek mines of the Utah Fuel Co., at the Nov. 4 election by a plurality of 393. Mr. Stroup was at the disad-



Main Haulage Road at No. 1 Mine North-East Coal Co.

This steel bridge has been constructed on the main haulage road between the "High Bridge" opening of No. 1 Mine and the older part of that mine, near Thealka, Ky. The steel section of the bridge is 600 ft. long. Wood approaches, 54 and 56 ft. long, have been built at either end. At the highest point the rail is 116 ft. above the fertile valley. This is the highest mine-car trestle in eastern Kentucky.

vantage of being on the Democratic ticket in a strong Republican year. However two other Democrats were elected to the commission for short terms. George H. Dern, a Democrat, beat Gov. Charles R. Mabey, Republican, both in Carbon County and in the state, and therefore takes the executive chair.

The United States Fuel Co. has appointed R. W. Sheppard district sales manager with offices at Portland and Seattle. Mr. Sheppard is a Northwestern man and has had considerable experience in the coal business.

William C. Stark, manager of the Citizens Coal Co. of Salt Lake City, and former president of the Utah-Idaho Retail Coal Dealers' Association, has been elected a member of the state House of Representatives. Mr. Stark was a member of the last Legislature. Elias S. Woodruff, who was a partner in the recent Woodruff-Sheets-Morris Coal Co., also has been elected to a seat in Utah's legislative body.

The Rains mine of the Carbon Fuel Co., which was wrecked by an explosion in September, resulting in the loss of five lives, has been reopened. The official report on the cause of the explosion has not yet been made.

WEST VIRGINIA

Officials of the union in southern West Virginia make no secret of the fact that although a few years ago the United Mine Workers had about 50,000 members in West Virginia, its membership is now less than 15,000, 12,000 of whom are employed in northern West Virginia mines. Union officials are inclined to blame their loss of membership on existing economic conditions.

Although seriously injured, suffering from a fractured skull and four broken ribs, sustained in an accident, it is believed that W. T. Hughes, president and general manager of the Fort Grand Coal Co., operating in Monongalia County, will recover. Mr. Hughes, with several employees had gone to a voting place in the county and was turning his car around when it slipped over a bank to the bed of a creek 60 ft. below. Only last July Mr. Hughes suffered a broken leg in an accident and had only recently been able to discard crutches.

When 18 or 20 miners ceased work and joined the United Mine Workers at the plant of the Sitnek Coal Mining Co., at Lumberport, in the Harrison County field, on Nov. 7 there was a temporary cessation of operations but it is stated by officials of the company that the Katherine mine was working as usual the following day with 50 miners. The company also states that it is still producing from 9 to 10 cars of coal a day. The officials of the union on the other hand claim that 100 miners at the plant are organized and that not more than 15 miners remain at work.

Eviction suits brought by the New England Fuel & Transportation Co. to gain possession of a number of houses at Everettsville, in Monongalia County, have been settled out of court under an agreement with counsel rep-

resenting the coal company and the United Mine Workers. Originally the suit was brought against 37 occupants of company houses, but since the time of filing the suit fourteen families have moved, leaving 23 who are covered by the agreement, which provides that the miners remaining in possession of company houses shall vacate on or before Jan. 5, 1925.

In connection with the semi-annual meeting of the West Virginia Mining Institute to be held on Dec. 3 at Welch, a first-aid and mine-rescue contest is to be staged with at least forty teams from Mercer and McDowell counties participating. Only a few days ago W. H. Forbes, assistant mining engineer in charge of work for the U. S. Bureau of Mines in West Virginia, returned to his headquarters at Huntington from the Pocahontas field, where he had been assisting in making preparations for the first-aid contest, which is to be in charge of C. C. Morfitt, secretary of the Tug River Operators' Association, assisted by Joseph Reed, safety director of the Consolidation Coal Co. and president of the West Virginia Mining Institute. R. M. Lambie, chief of the department of mines of West Virginia, has been in the Pocahontas field for several days in preparation for the first-aid contest.

WYOMING

Having this summer completed water systems for the company camps of Hanna and Winton, the Union Pacific is now constructing a new water system for Reliance. The new wells also will supply the Union Pacific R.R. switching locomotives with water, relieving a train on the Rock Springs system.

CANADA

The Coal Creek Collieries of the Crows Nest Pass Coal Co., have been closed down indefinitely. W. R. Wilson, president and general manager of the company, explains that lack of trade makes continuance of work at present out of the question. It is understood that the Michel Collieries are to continue production. The company's decision throws 750 men out of work and the provincial government has sent a deputy Minister of Labor to inquire into the situation.

The Western Fuel Corporation of Canada has moved its sales office from Nanaimo, where it was established more than 70 years ago, to Vancouver. J. G. Lawrence is the general sales manager and W. A. Webb, formerly agent for the company in Vancouver, has been made assistant sales manager.

The Princeton (B. C.) Collieries, Ltd., which absorbed the Princeton Coal & Land Co. eight months ago, has uncovered a 22-ft. seam of bituminous coal.

The government of Alberta has appointed a commission to make a comprehensive survey of the coal industry of the province, including methods of marketing on the prairies. The commissioners are H. M. E. Evans, who is largely identified with the industry in

northern Alberta, chairman; Robert C. Drinnan, director of the Mountain Park and Luscar Collieries, representing the operators, and Frank Wheatley, president of the Alberta Federation of Labor, Blairmore, representing labor.

The existence of coal deposits in the Sudbury district of Ontario has been known for many years, but whether the field was commercially valuable has been a subject of much controversy. The government geologists who have made investigations usually have taken an unfavorable view. The Colonial Coal Co., of Toronto, after preliminary diamond drilling, has come to the conclusion that mining can be profitably undertaken and is putting down a shaft. The progress of the work will be watched with much interest as a possible step toward the solution of Canada's fuel problem.

New Companies

The Cabin Creek Coal Co. has been incorporated in Walch, Okla. by L. M. Green and H. E. Ryker, of Walch, and H. L. Cheyne, of Miami, Okla.

The Glen Mary Coal Co., James Building, Chattanooga, Tenn., has been incorporated with a capital stock of \$50,000 by H. B. Bonney, E. W. Elmore, J. F. Falzow and others and will acquire and develop property at Glen Mary, Tenn.

The Saxton Blue Gem Coal Co. has been incorporated in Saxton, Ky., by J. M. Persifull, James Percifull and others.

The New Coal Co. has been incorporated in Pineville, Ky., by M. M. Cox, H. I. Cawthorn and M. Brandenberg.

The Ohio River Edison Coal Co., Knoxville Village, Ohio, has been chartered with an authorized capital of \$200,000 to mine coal and deal in coal and coke. Incorporators are Union C. DeFord, Donald J. Lynn, T. Lamar Jackson, Norman A. Enery and David E. Jones.

The Diamond Clay Products Co., Ironton, Ohio, has been chartered with an authorized capital of \$1,200 shares, no par value designated, to operate coal properties. Incorporators are M. P. Krag, Wm. H. Myers, H. S. Miller, W. H. Webb and Robert J. Beatty.

The Cedar Grove By-Product Coal Co. has been organized with a capital stock of \$25,000 to operate at Fred, W. Va., in the Kanawha field. Active in organizing this company were John D. Alexander, W. A. Alexander, Elizabeth Alexander, S. V. Morris and H. C. Ferguson, all of Charleston, W. Va.

Industrial Notes

The Fuller-Lehigh Co. has entered into an agreement whereby everything in connection with its pulverized coal business will be handled in the various countries throughout the world by Babcock & Wilcox, Ltd., of London, with the exception of the United States, its dependencies, Canada and Mexico.

The Beaupre Co., Inc., manufacturer of forging hammers, recently moved into its new factory, on the Revere Beach Parkway, Everett, within three miles of the business center of Boston. The main building is 70 x 140 ft., of concrete and steel sash construction, and has the most modern equipment.

The Combustion Engineering Corporation announces that James Cleary, formerly manager of their Philadelphia office, will assume management of the Detroit and Cleveland territories with headquarters in Detroit. Frank Henderson will continue in charge of the Cleveland office. Joseph Lappin, formerly in charge of the Detroit office, has been assigned to New York for special work. The Detroit office has been removed from the Penobscot Building to the Book Building, 1227 Washington Boulevard.

Traffic

Approve New Rates in New York

The Public Service Commission of New York has approved joint rates on coke, coke breeze, coke dust and coke screenings, the direct products of coal, in carloads on the Delaware, Lackawanna and Western R.R. from Harriet to various stations on the Buffalo, Rochester & Pittsburgh; of the Lehigh Valley from Harriet to various stations on the Buffalo, Rochester & Pittsburgh and the Pennsylvania R.R.; of the New York Central (east) from Harriet to various stations on the Buffalo, Rochester & Pittsburgh and Pennsylvania R.R., effective Dec. 7 to 9, 1924. No joint rates have hitherto been in effect.

Approval also has been given to new rates on the same commodities on the New York Central (West) from Buffalo and East Buffalo to Derby of \$1.13 per net ton (reduction, 13c.); to Portland, \$1.39 (reduction 12c.); to Van Buren, \$1.39 (increase, 13c.), and to Westfield, \$1.39 (reduction, 12c.), effective Dec. 10, and to reduced rates by the New York, Chicago & St. Louis R.R. on the same products from Buffalo and Buffalo Junction to various stations west, effective Dec. 10.

Hearing to Consider Proposal to Advance Hard-Coal Rates

The Coal and Coke Committee, Trunk Line Territory, announces a Public Hearing, 11 a.m., Dec. 4, at 143 Liberty Street, New York, on a carriers' proposal to advance rates on anthracite, buckwheat and smaller sizes, from Taylor, the Scranton-Taylor Coal Co.'s washery at Pyne and Jermyn No. 1 collieries to stations on the Delaware, Lackawanna & Western R.R., Forty-Fort, Pa., to Plymouth, Pa., inclusive. The present rate is 88c. per gross ton and the proposed rate is \$1.01 per gross ton. The reason for the proposal is to remove violation of the long and short-haul clause of the Pennsylvania State Constitution.

Indiana Coal Fields Fear Rate Discrimination

Coal producing fields of the Wabash valley are vitally interested in the Interstate Commerce Commission's hearing on coal freight rates from Ohio and West Virginia to Indiana points, set for Nov. 28 at Indianapolis. If further decreases are granted in rates from Ohio and West Virginia, as petitioned by the Indiana State Chamber of Commerce, without a corresponding adjustment between Indiana points and from the Indiana fields to Michigan and other points north and west it is felt that the Indiana producers will suffer.

The Terre Haute Chamber of Commerce co-operated with the State Chamber in the rate equalization fight which resulted in the present tariffs, making it possible for Indiana to compete more easily with Ohio and West Virginia. In the hearing set for Nov. 28 the Terre Haute Chamber of Com-

merce will appear to protect the interests of the Indiana producers and miners, but the petition of the state chamber asks for a further reduction of rates from the Ohio and West Virginia fields to Indiana points.

Association Activities

"Pioneer Development of the Coal Mining Industry in Northern Cambria County" was the subject of an interesting address delivered by James A. McCain, banker and former coal operator, at the seventh semi-annual meeting of the Mining Institute of the Fifteenth Bituminous District of Pennsylvania, held in Barnesboro, Pa., on Nov. 1. Other speakers at the meeting were W. F. Dill, of Barnesboro; W. G. Duncan, of Connellsburg; J. F. MacWilliams, of Cresson; J. I. Thomas, of Johnstown; E. A. Holbrook, dean of State College; Joseph Williams, of Altoona; J. T. Ryan, of Pittsburgh; N. D. Hubble, of State College, and Prof. William R. Chedsey, of State College.

Obituary

George F. Cant, of Huntingdon, Pa., who was an operator of coal mines in Cambria County, died suddenly at his home in Huntingdon, Nov. 2. For the last six months Mr. Cant's heart had been affected, but his death was sudden. He operated the Warren Collieries, at Nanty Glo, Pa., for the past six years. Prior to that he had been engaged in operating a gold mine in North Carolina, and bituminous coal mines in the Broad Top section, Bedford County, Pa.

Henry J. Burton, Sr., 60, widely known mining engineer and formerly a mine examiner, died at his home in Pana, Ill., Nov. 3, after having been in bad health for five years. He leaves a widow and two children.

W. H. Lake, a leading business man of Picou, Ont., died suddenly Nov. 2, aged 82 years. He had been engaged in the coal trade for many years until his retirement a few months ago. He leaves a wife and one daughter.

W. Hubert Young, age 43, a prominent coal man of Oneonta, Ala., died Nov. 12 in a local infirmary after a short illness.

Coming Meetings

Lehigh Valley Section of American Institute of Electrical Engineers. Annual meeting, evening of Nov. 21, Schuylkill Country Club, Pottsville, Pa. Member Executive Committee, W. H. Lesser, Frackville, Pa.

Illinois Mining Institute. Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

National Exposition of Power and Mechanical Engineering. Annual exposition, Dec. 1-6, Grand Central Palace, New York City. C. F. Roth, Grand Central Palace, New York City.

American Society of Mechanical Engineers. Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

West Virginia Coal Mining Institute. Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

Coal Mining Institute of America. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

American Institute of Mining and Metallurgical Engineers. Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

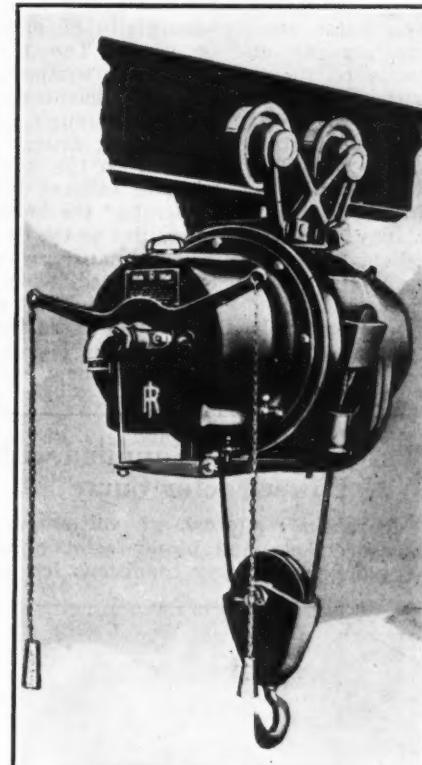
American Institute of Electrical Engineers. Midwinter convention, Feb. 9-12, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

New Equipment

These Air-Motor Hoists Are Fit for Many Jobs

The new line of air-motor hoists recently developed by the Ingersoll-Rand Co., 11 Broadway, New York, contain many novel and distinctive features and in addition possess all the essential features which two decades of familiarity with the field has shown the manufacturers to be necessary.

The new hoists are suited for a wide



Air-Driven Shop Hoist

These units are ruggedly built, if greatly overloaded they merely balk, but can be started up again when the load is reduced without any serious effects.

range of service and are used in all manner of industries where rapid and economical lifting and handling of loads is desired.

The 500-lb. capacity hoist was recently put on the market but now the company has developed four larger sizes of similar design so that the same type of hoist is available for heavier work. The four new sizes embody all the features of the smaller hoist except for such variations as in the gearing on the two heaviest sizes, etc.

The outstanding characteristics of the new hoists are briefly as follows: Compactness of design, resulting in low headroom required; relatively light weight; automatic brake which positively holds the load under all circumstances—even if the air supply should become disconnected or fail; and a

graduated throttle which permits a very close regulation of both the lifting and the lowering speeds.

A balanced three-cylinder air-motor is used which operates in either direction and without vibration at any speed or load and within the rated capacity of the machine. The new motor retains all of the best features which have established their worth by long service, and furthermore embodies new features which add to its economy and durability. Some of the advantages of this motor are its freedom from vibration, the ready manner in which it can be throttled down slowly at all loads and its remarkable absence of lubricating troubles, even when subjected to considerable neglect and abuse.

It should therefore be noted that these hoists are entirely distinct from direct acting cylinder hoists and lifts. The latter consist essentially of only the plunger and a case. The air hoists, on the other hand, are equipped with a high-powered and efficient air motor which is geared through a mechanical train to a hoisting drum.

The throttle graduation on the new hoists is very fine and this ensures instant and complete control of the hoist at any speed and contributes to the excellent operating performance. A safety stop lever is provided which closes the throttle and stops the motor whenever the load by chance is raised to the top of the hoist lift.

The automatic brake is a new and

valuable feature as it holds the load at any desired position for any length of time, regardless of air pressure. The brake consists of a disc attached to the motor shaft, and of a brake plunger with a friction face, which is held in contact with the disc by springs whenever the hoist is not operating, i.e., whenever the air supply to the motor is cut off either by throttling or otherwise. It is entirely automatic in its action and requires no attention from the operator.

The lubrication of all parts has been thoroughly provided for. The motor and gears are both inclosed. The motor operates in a bath of oil and the gears turn in a heavy grease. Oil passages lead to all bearings.

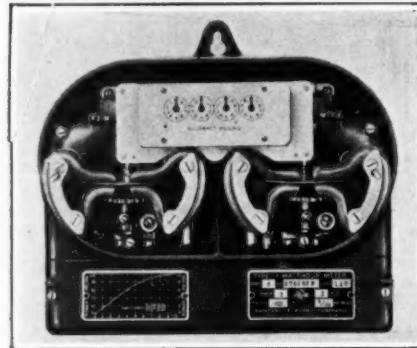
Ball bearings or bronze bushings are provided at all points where experience has indicated they will add to the efficiency or life of the hoist.

These hoists are capable of standing up remarkably well under hard service. If a hoist be overloaded it is only necessary to remove the overload, after which the hoist will start up and work again as well as ever.

A roller bearing mono-rail trolley or top hook mounting can be provided as desired. The trolley mounting reduces considerably the head room necessary for installing. Further, because of its rigidity, which enables an operator easily to start a loaded hoist along a runway, it proves more satisfactory than hooking into a separate trolley unit.

Watthour Meter Supplied with Power-Factor Curve

Increasing interest in volt-ampere measurements and power-factor analysis under operating conditions led to



View with Cover Removed

Independent element construction affords a means for determining the power-factor of a load, simplifies meter calibration, and reduces repair part stocks.

the development of a new type polyphase watthour meter by the Sanguo Electric Co. of Springfield, Ill.

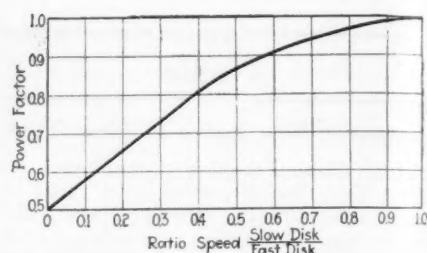
The meter has two completely independent single-phase elements, placed side by side instead of one above the other, and geared to a differential train that totalizes on a single register the algebraic sum of the energy measurements of the two elements.

By noting the number of revolutions made by each of the two disks during a definite interval of time the power-factor readily can be determined from

a graph mounted near the name plate on the box cover. All that is necessary is to divide the number of revolutions made by the slower moving disk by the number of revolutions made by the other disk. The graph or curve then can be used to convert this quotient into power-factor.

METER ELEMENTS ARE INDEPENDENT

Electrically and mechanically the two meter elements are entirely independent and each may be calibrated exactly like a single-phase meter and adjusted without reference to the other. It is claimed that this requires less time and equipment than ordinarily necessary.



Power-Factor Chart Mounted on Case

Assume one element makes 4 revolutions while the other makes 10. Find the ratio between these (0.4) on the base line, move upward to intersection with the curve then to the left and the reading shows a power factor of 0.8 or 80 per cent.

for calibrating the familiar type of polyphase meter.

In this new meter all constructional details except the base, case and register are identically the same as in the single-phase meters which the company has been making for a number of years.

Heat Exchanger Is Compact And Leakproof

A novel design of heat exchanger for the efficient interchange of heat between liquids is shown in the accompanying illustration.

By using two short exchangers connected by a flexible bend and shell cover, a compact, rugged, readily portable, and easily installed unit is obtained, approximately half the length of a single unit designed for equivalent duty. This twin arrangement divides the tubes and shell expansion parts into two units, and makes inspection and cleaning much easier.

In this exchanger, the cooling liquid and the fluid to be heated flow in opposite directions in order to provide the most efficient exchange of heat. Two styles of baffles are used to guide the liquid around the tubes, the selection depending upon the loss of pressure in the shell that conditions will permit. To simplify piping all connections are at the same end. Floating heads and head covers eliminate the strain on tube heads and prevent danger of cracked tube plates. This heat exchanger is manufactured by Griscom-Russell Co., 90 West St., New York.

